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Form Approved  
OMB No. 0704-0188

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1. REPORT DATE (DD-MM-YYYY) 12-06-2009	2. REPORT TYPE Master's Thesis	3. DATES COVERED (From - To) 23-07-2008 to 12-06-2009	
4. TITLE AND SUBTITLE  National Strategic Planning: Linking DIMEFIL/PMESII to a Theory of Victory		5a. CONTRACT NUMBER	
		5b. GRANT NUMBER	
		5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)  Col John P. McDonnell, USAF		5d. PROJECT NUMBER	
		5e. TASK NUMBER	
		5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)  Joint Forces Staff College Joint Advanced Warfighting School 7800 Hampton Blvd. Norfolk, VA 23511-1702		8. PERFORMING ORGANIZATION REPORT NUMBER  JFSC 25789	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)	
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release, distribution is unlimited			
13. SUPPLEMENTARY NOTES			
14. ABSTRACT. All too often, military operations are planned and conducted without a clear understanding of the political endgame expected to occur on the adversary's side, or by simply assuming rational calculation. Clausewitz states that war is the continuation of policy by other means, yet policymakers do not always articulate how they believe military operations will lead towards the desired political end state. Instead, the end state is left in military terms; with the result that military operations can achieve every stated objective condition, yet the policy aims remain unfulfilled. This is a two-part problem, one theoretical and one practical, and both are interlinked. The theoretical problem is the lack of a mental framework tying the desired end state (usually broadly stated) to the activities undertaken with the instruments of national power. This is a "theory of victory," which describes how the instruments, properly utilized, have effects which lead to reactions and ultimately to particular political endgames within the adversary's political system. The practical problem is tracking the many activities contained in a plan to establish that they have some logical linkage to the ultimate end. Military plans are immense. The implied logic behind every activity is not always obvious, and it strains credulity to believe that planners can be sure they are not working at cross-purposes. Yet, just as planners must do the thinking, surely tools beyond word processors can be provided to help them with mindless task tracking. This thesis establishes a theory and tests it against the real world, ties it to a practical tracking methodology, and examines one possible means to assist planners in examining the logic they express.			
15. SUBJECT TERMS DIMEFIL, PMESII, National Strategy, Victory, Political Endgame, Athena			
16. SECURITY CLASSIFICATION OF:  a. REPORT Unclassified		17. LIMITATION OF ABSTRACT  b. ABSTRACT Unclassified	18. NUMBER OF PAGES  c. THIS PAGE Unclassified
		19a. NAME OF RESPONSIBLE PERSON Ms. Stacey Newman	19b. TELEPHONE NUMBER (include area code) 757-443-6301



*JOINT FORCES STAFF COLLEGE*  
JOINT ADVANCED WARFIGHTING SCHOOL



NATIONAL STRATEGIC PLANNING:  
LINKING DIMEFIL/PMESII TO A THEORY OF VICTORY

by

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A paper submitted to the Faculty of the Joint Advanced Warfighting School in partial satisfaction of the requirements of a Master of Science Degree in Joint Campaign Planning and Strategy.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Joint Forces Staff College or the Department of Defense.

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April 2009

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## ABSTRACT

All too often, military operations are planned and conducted without a clear understanding of the political endgame expected to occur on the adversary's side, or by simply assuming rational calculation. Clausewitz states that war is the continuation of policy by other means, yet policymakers do not always articulate how they believe military operations will lead towards the desired political end state. Instead, the end state is left in military terms; with the result that military operations can achieve every stated objective and fulfill every stated condition, yet the policy aims remain unfulfilled.

This is a two-part problem, one theoretical and one practical. Both are interlinked, and not addressing both together has led to partial solutions which are unwieldy and impractical in real-world application. The theoretical problem is the lack of a mental framework tying the desired end state (usually broadly stated) to the activities undertaken with the instruments of national power. This is a “theory of victory,” which describes how the instruments, properly utilized, have effects which lead to reactions and ultimately to particular political endgames within the adversary’s political system.

The practical problem is tracking the many activities contained in a plan to establish that they have some logical linkage to the ultimate end. Military plans are immense. The implied logic behind every activity is not always obvious, and it strains credulity to believe that planners can be sure they are not working at cross-purposes. Yet, just as planners *must* do the thinking, surely tools beyond word processors can be provided to help them with mindless task tracking. This thesis establishes a theory and tests it against the real world, ties it to a practical tracking methodology, and examines one possible means to assist planners in examining the logic they express.

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*“We seek an independent, free and secure Iraq.”*

*--President George W. Bush<sup>1</sup>*

## INTRODUCTION

“The first, the supreme, the most-far reaching act of judgment that the statesman and commander have to make is to establish...the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature. This is the first of all strategic questions and the most comprehensive.<sup>2</sup> The political object—the original motive for the war—will...determine both the military objective to be reached and the amount of effort it requires.<sup>3</sup> War is thus an act of force to compel the enemy to do our will...to impose our will on the enemy is its object. To secure that object we must render the enemy powerless; and that, in theory, is the true aim of warfare. That aim takes the place of the object, discarding it as something not actually part of war itself.”<sup>4</sup>

In just a handful of sentences, Clausewitz outlines both the goal and the bane of political strategists throughout history. War is fought for political purposes—it is not a game, like chess or football, where there is no goal beyond winning as defined by the game’s rules. The *political purpose* is the higher purpose.

The decision to go to war, and the ultimate aim to be achieved, falls upon the statesman. So, too, do the broad decisions about acceptable costs to be borne and means to be employed. The military must formulate its strategies constrained by those decisions. But Clausewitz also assumed that military victory over fielded forces, at least

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<sup>1</sup> *Public Papers of the Presidents: George W. Bush, Vol 1*, 558.

<sup>2</sup> Carl von Clausewitz, *On War* (Princeton: Princeton University Press, 1976), 88-89.

<sup>3</sup> *Ibid*, 81.

<sup>4</sup> *Ibid*, 75.

in theory, automatically resulted in obtaining the political goal. The military aim thus replaces the political object. To Clausewitz, the *political object* is *discarded*.<sup>5</sup>

It seems almost self-evident. In the Austro-Prussian war, Bismarck ordered his generals to stop as soon as the Austrian forces were defeated—a march on the capital was not even required.<sup>6</sup> When Alexander the Great defeated any number of armies, he simply occupied their cities and established a new government before moving on.<sup>7</sup> But, in these examples, military occupation was a practical option, and civil resistance was utterly impractical. The Romans demonstrated to any who challenged them the futility of civil resistance to an organized army.

When occupying an enemy's territory is either impractical or undesirable, the link between achieving the military aim and obtaining the political object suddenly seems more tenuous. Unless the political aim *is* the military aim—such as destroying something the enemy possesses, it is not at all clear how obtaining the military aim necessarily obtains the military object.

In his April 13, 2004 press conference, President Bush outlined a vivid description of his desired national strategic end state in Iraq: a stable, secure, free, and independent country, at peace with its neighbors.<sup>8</sup> Setting aside the issues with the major combat operations and the problems resulting after Baghdad fell, by the time he gave his speech, he knew what he wanted that part of the world to look like. The question was how to obtain it?

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<sup>5</sup> Ibid.

<sup>6</sup> Columbia Encyclopedia, Sixth Ed., s.v. "Austro-Prussian War," <http://www.bartleby.com/65/au/AustroPr.html> (Accessed 14 March 2009).

<sup>7</sup> Jona Lendering, "Alexander the Great," *Articles on Ancient History*, <http://www.livius.org> (Accessed 14 March 2009).

<sup>8</sup> *Public Papers of the Presidents: George W. Bush, Vol 1*, 557-571.

A counterinsurgency may provide the clearest example of military victory on the battlefield not necessarily translating into the desired end state, precisely because counterinsurgency is not a purely military problem. However, military strategists attempting to make the translating linkage cannot simply point out the problem's difficulty. They must solve it, and to do so, they need a means to help them think through the connections—they need a “mental model” or “mental framework” on which to hang their ideas. Such a framework would help them think through the logic of their assumptions—why using the military instrument to obtain *this* particular goal will drive the enemy political system towards the desired end state. Further, strategists must consider why, if every stated goal is achieved by every instrument of national power, this necessarily results in the desired reaction in the enemy political system.

This has been called a “Theory of Victory,” and various constructs have been proposed, ranging from purely abstract to more concrete. But, the basic premise forms *the first part of the thesis*: if national leadership—both civilian and military—had a better framework for describing victory, then strategic planners could do a better job of tying the desired political end (the object) to an obtainable military end (the aim). The problem becomes larger when considering not only military, but all instruments of national power. To paraphrase Clausewitz, if the political aim *is* simply the military objective, then the problem is easy.<sup>9</sup> The challenge occurs when the political aim must be *translated* into some military objective.

To state it explicitly, much of the disconnect between civilian political leadership and military leadership stems from a mutual inability to articulate a common vision which describes the desired end state and then to identify military (or other) aims that can

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<sup>9</sup> Seizing some peripheral province, to borrow an example.

be clearly shown to lead to the political goal. As just introduced, part of this disconnect results from lack of a mental “framework” for defining victory, but part also results from an inability to track what the various elements of national power are to do in pursuit of the political goal.

This forms *the second part of the thesis*: if strategists had the capability to record their logic and to track what the myriad activities of their plans are supposed to be accomplishing, then they would be able to better link those activities to the political end.

A common method used to describe any nation is the “PMESII” model, which broadly identifies its Political, Military, Economic, Social, Infrastructure, and Information components.<sup>10</sup> It can be used in complex analysis, or simply as a rough outline.

Similarly, the instruments of national power are commonly described using the “DIME” model, or Diplomatic, Informational, Military, and Economic. “Whole of government” participation by the Departments of Justice and Treasury, and various intelligence agencies, resulted in an extension to “DIMEFIL,” introducing Financial, Intelligence, and Legal instruments.<sup>11</sup> Regardless, DIME or DIMEFIL represents the available national *means*.

Planners orchestrate the available means, and, in theory, each of the means conducts activities that result in intermediate end states. While Clausewitz wrote of the military aim—the military end state—in fact, there is a diplomatic aim, an economic aim,

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<sup>10</sup> U.S. Joint Chiefs of Staff, *Joint Publication 2-0: Joint Intelligence*, Washington, DC: Government Printing Office, 22 June 2007, IV-21.

<sup>11</sup> Cale Horne, Stephen M. Shellman, and Brandon Stewart, “Nickel and DIMEing the Adversary: Does it work or PMESII them off?” University of Georgia and College of William & Mary: Violent Intrnational Political Conflict & Terrorism Research Lab, undated. [http://www.allacademic.com//meta/p\\_mla\\_apr\\_research\\_citation/2/5/3/2/7/pages253278/p253278-1.php](http://www.allacademic.com//meta/p_mla_apr_research_citation/2/5/3/2/7/pages253278/p253278-1.php) (Accessed 20 March 2009).

etc. From here on, the term “end state” will be used in place of “aim” to describe the intermediate result sought by the activities of an instrument of national power. Thus, leadership faces not only the problem of tying the military end state to the political objective, but also the diplomatic end state, economic end state, etc. Tying, mapping—Clausewitz has no word for this task, since it was the very part he discarded.<sup>12</sup> Yet, this is the crux of the issue, if “war termination” is ever to mean more than a description of military conditions. Chapter 1 will show that war termination, at the policymaker level, must ultimately be a discussion about political endgames.

Chapter 2 will examine DIMEFIL and PMESII in more detail, but at this point, it is enough simply to note that a plan mapping “our” DIMEFIL to “their” PMESII is faced with 42 combinations at the first level of analysis. Unfortunately, simply picking a different planning construct does not simplify the real world; it merely increases the chance of a critical element being overlooked.

Thus, the planner attempting to tie the military end to the political object not only must understand how the two interrelate, but also must track the logic behind each of dozens of tasks being orchestrated, ensuring they are not actually working at cross purposes. Such “wicked” problems have been the subject of much research, particularly using information technology tools, often with little success.<sup>13</sup> Those failures suggest a different, classic approach—use a tool to record the reasoning, but rely on the person for the thought. Then, examine whether a tool can illuminate logical disconnects in the plan.

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<sup>12</sup> Although Brodie suggests that Clausewitz himself may not have been entirely convinced about discarding the political object. See Bernard Brodie, “A Guide to the Reading of On War,” in Clausewitz, *On War*, 644-645.

<sup>13</sup> Examples of information technology tools include USSTRATCOM’s Integrated Strategic Planning and Analysis Network (ISPAN), various effects-based work at USJFCOM, and Air Force Research Laboratory’s Java Causal Analysis Tool (JCAT)—all of which showed promise; none of which have been accepted as a solution.

Clausewitz's political object is the ultimate result sought by the national policymaker. In military jargon, the political object is the political *end*. It is the end state sought by all the elements of national power combined. It is the desired national strategic end state, or desired NSES.

*The thesis can thus be restated:* Only if national leadership has an effective model to tie national elements of power to the desired national strategic end state, and a practical means is available to record planners' reasoning, will strategic planners be able to routinely tie the desired political *end* to the available *means* in understandable ways.

This problem, then, contains two parts: one theoretical and one practical. Both are interlinked, and not addressing both together has led to partial solutions which are unwieldy and impractical in real-world application.

The theoretical part is the missing mental framework tying the Desired End State (DES) to the intermediate end states brought about by the DIMEFIL elements of national power. The DES is usually simply and broadly stated; DIMEFIL establishes multiple, interlocking lines of operation (LOO's) led by different agencies with different planning constructs. There is an intellectual leap required to explain how these LOO's, collectively, lead to the DES. In other words, there is no theory (in the social science sense) for how victory is to be achieved. Chapter 3 will propose such a theory.

The practical element is a methodology to keep track of the myriad activities undertaken by the agencies responsible for some small piece of the overall plan. The key is to describe, conceptually, the expectations for each activity—that is, what is the expected result, and why is that expected? In other words, what is the causal mechanism for activity A leading to result B, and why does result B lead towards the DES? The

point is NOT to be deterministic. War and international relations are activities governed by human beings, who will interact in unimaginably complex ways. The purpose of recording the thought process is to explicitly state the assumptions and thinking being made by planners at all levels (e.g. National Security Council to Joint Task Force). (In this context, these are not “assumptions” as commonly used by military planners in their joint planning process.)

By explicitly describing the planners’ thought process, the rationale can be challenged, and unexpected results recognized as such. In general, this simply describes good planning, but most planning problems are so complex that it is extraordinarily difficult to keep track of the pieces. Instead, the decision maker is left to rely on coup d’oeil or the manual efforts of a staff mindlessly collecting data.

Chapter 4 will examine one tool to evaluate whether software can assist in tracking these pieces, freeing the staff to think. This examination will emphasize tracking conceptual pieces, not deeper data. In particular, the analysis will probe whether a software tool can identify activities that are working at cross-purposes, based on reasoning that the planners themselves have expressed. If it can, then it should be able to identify where members of a team are inadvertently advancing counterproductive approaches or inconsistent ideas within a plan.

Chapter 5 will then apply the entire framework to real-world case studies, to conduct an initial evaluation of the concept’s practicality.

From here, desired National Strategic End State (NSES) will generally be used in place of “political object,” in order to avoid confusion with the political component of PMESII, and to avoid confusing the goal of the statesman with the machinations of the

politician.<sup>14</sup> There will be lesser desired end states (at least one for each DIMEFIL element), and there may be lesser desired strategic end states, but the desired NSES reflects the capstone.

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<sup>14</sup> Although both are important, so is the distinction, as demonstrated by discussions of Clausewitz' "politik" as either (or both) policy or politics. See, for example, Antulio J. Echevarria II, Review of Christopher Bassford's *Clausewitz in English: The Reception of Clausewitz in Britain and America 1815-1945*, New York: Oxford University Press, 1994, in "Armed Forces & Society 22, No. 1," (Fall, 1995), Sage Journals Online, 131-133. <http://www.clausewitz.com/CWZHOME/BOOKS/Bassford/ECHREV.htm> (Accessed 19 March 2009).

## CHAPTER 1

### STRATEGIC EFFECTS TO POLITICAL ENDGAME

There is a saying that “airpower or a laptop never held a street corner.” Although clearly intended as a response to the idea, expressed by some airpower zealots, that air or cyber power could win wars on its own, it also encapsulates the assumption that a “war” is won when the enemy’s country is occupied—or at least when the clear threat of occupation is believable and imminent.

But, if advocates such as Warden fail to identify how “paralysis” leads to political victory, their detractors equally fail to provide policymakers much help when full-scale war and occupation or regime change are obviously not options.<sup>15</sup> “You may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life--but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did, by putting your young men into the mud.”<sup>16</sup> Yet, how often does that happen? How often does the United States, in particular, have the slightest interest in keeping any piece of an adversary’s territory, even temporarily? Operations in Afghanistan and Iraq are especially noteworthy, because they are unusual in today’s world—how often, throughout history, have militaries been used successfully in lesser cases, where neither side had any illusions that military occupation was on the table?

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<sup>15</sup> *Paralysis* is the concept that rapid, parallel attacks across many targets may so dislocate an adversary that it is unable to effectively respond. The challenge for the strategist is determining what to do with (or to) the adversary while he is paralyzed, and this gap in thinking is often cited as a criticism of Warden.

<sup>16</sup> T.R. Fehrenbach, *This Kind of War* (New York: Macmillan Company, 1963), 427. Fehrenbach further asserts that “the object of warfare is to dominate a portion of the earth, with its peoples.”

The point is that whether conducting a raid, a punitive action, or any number of similar activities, policymakers approve the military operation with some intuitive sense that the political object will be achieved, even if they cannot precisely articulate how. They believe that the situation after obtaining the military aim will be closer, at least, to their desired National Strategic End State (NSES). They have an intuitive “theory of victory” under which they operate.

The difficulty arises when their theory of victory is flawed—when the implicit assumptions they have made go unchallenged, and military success does not lead to political success. That is the first problem to be examined.

Many authors have attacked this problem. In his 2008 *Parameters* article, Bartholomees took an entirely theoretical and somewhat quantitative approach, incorporating aspects of work by Colin S. Gray and William Martel.<sup>17</sup> Bartholomees posited that since war is a political act, victory must be a political condition, and he concurred that operational or tactical victory does not automatically translate into favorable political outcomes.<sup>18</sup> However, the notion that victory and defeat are merely opposite points on a spectrum does not help the policymaker express what is desired. If the scale is, “Victory—win—not lose—tie—not win—lose—defeat,” the policymaker may be excused for selecting “victory.”<sup>19</sup> Bartholomees defines each term, but still in an abstract way. “[V]ictory will be essentially total and probably final...it will resolve the underlying political issues.” Winning implies “not...reaching total political success.”<sup>20</sup> He does offer an important consideration that, if the “loser’s” goals are very limited, it

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<sup>17</sup> J. Boone Bartholomees, “Theory of Victory,” *Parameters* (Summer 2008), 27.

<sup>18</sup> Ibid, 26.

<sup>19</sup> Ibid, 27.

<sup>20</sup> Ibid, 28

may be possible for both sides to ultimately claim victory—that is, both could achieve their desired political goals. However, he does not offer much help to the policymaker when he asserts that “victory” is ultimately defined by people’s opinions, whether those of his own population, allies, or the world.<sup>21</sup>

The Naval War College’s Bradford Lee approaches the problem differently. He begins with, essentially, a wargaming approach, in which the actions of each side are considered in turn. He then continues with what could be considered a Socratic approach to draw out the planners’ reasoning.<sup>22</sup>

In the first steps, the strategist is asked to think through friendly actions and consider likely enemy responses. The questions posed at these steps are more abstract than a typical military wargame, in order to set up the follow-on thought process—the “so what?” of achieving military success.

In considering national strategic courses of action, the Lee model asks the planner to consider how instruments of power are to be employed at the grand strategic level. Will the nation be on the strategic offense? Will it pursue a strategic defense? What levels of risk are acceptable, both to the force and to the nation?

This sets the stage for the discussion, planting it firmly at the grand strategic level. This first question for consideration is not about tactical employment of forces; rather, it asks the Clausewitzian question, ‘What is this war about?’<sup>23</sup> Will this war simply seize a few peripheral territories, or will it overthrow the enemy regime? Is this war’s goal

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<sup>21</sup> Ibid, 31-32.

<sup>22</sup> The entire model is depicted, for reference, in Appendix D.

<sup>23</sup> Clausewitz, *On War*, 603-604.

simply to drive up the enemy's cost until he agrees to terms? Will the nation be 'all-in' in a contest for survival, or is this a war of choice?<sup>24</sup> (See Table 1, left column.)

**Table 1. Lee Model friendly action/enemy reaction**

<b>Courses of action and Enemy military action/reaction</b>	
<i><b>Friendly courses of action</b></i>	<i><b>Enemy military action/reaction</b></i>
- How to employ (offense/defense/levels of risk)?	<i>When considering enemy capabilities, avoid mirror-imaging, scriptwriting, etc.</i>
- Which instruments of <i>national</i> power?	- How will enemy fight?
- Which instruments of <i>military</i> power?	--Symmetric/asymmetric
- Operational concept for instruments?	- How <i>well</i> will enemy fight?
- Military objective/target selection?	- Given these, how will interactions play out?

The next question is related, asking the planner to consider which instruments of national power, and particularly which military instruments, are to be employed. Again, this is not a tactical question, but frames the debate—is this a raid (perhaps an air strike) to punish misbehavior on the part of some adversary? Is it a naval blockade? Are land forces being contemplated?

Similarly, what is the concept for using the military instruments? While this question dips perilously close to the military commander's operational level of war, the point again is to think about the nature of the activity to be embarked upon. Is this an invasion or a raid? Will naval forces simply patrol, or will they actively conduct an offensive counter-piracy campaign? If the political leadership is willing to use land forces, may they be committed for a long period of time?

Finally, when contemplating the initial course of action, the grand strategist must ask what the military objective is. Ideally, he should ask the policymaker. If answers are

<sup>24</sup> Baron Antoine Henri de Jomini, *The Art of War*, rev. ed. (London: Greenhill Books, 1996), 14-15.

not forthcoming, he must ask himself, based on what the policymaker has said. If the activity is a punitive raid, this discussion could even examine possible targets, or target classes. Since the objective in such cases is simply to punish an adversary, the political consequences and benefits of attacking certain, specific targets should rightly be debated at the highest levels. If the objective is to overthrow a regime and occupy the enemy's country, then the political leadership must ensure such a goal is clear from the outset. For the more likely range of activities in between, a broad understanding of the desired goals provides the military commander with the guidance necessary to begin more detailed planning.

The Lee model next turns to initial examination of the enemy's military actions or reactions. (See Table 1, right column.) While the military commander will proceed with a Commander's Estimate of the Situation, a simpler set of questions is useful at the highest levels: How will the enemy fight? Will it be a symmetric or asymmetric contest? How *well* will the enemy fight? Given the anticipated answers to these questions, is the contemplated course of action still logical? Do these answers about enemy responses reflect what the enemy is likely to do, or are the political strategists inadvertently mirror-imaging what they would do in a similar situation?

In a military wargame, this process repeats with friendly move/enemy countermove until the “war” is “over,” or at least until some conditions are reached, perhaps setting the stage for a follow-on operation. In the Lee model, however, that may not be necessary, at least not initially. Rather, with the mental stage set, the planner leaps ahead and considers the strategic effects resulting from the course of action selected. Essentially, the planner assumes that if all goes well, ultimately some strategic effects are

obtained. That is, when a military objective is achieved, a military state of affairs is obtained. In campaign design, this is sometimes referred to as the desired military end state, tacitly assuming that the actual state of affairs will roughly correspond to a previously defined desired set of conditions.<sup>25</sup> A question to be considered later is whether the *way* in which those military effects are achieved (e.g. speed) ultimately affects the strategic effects obtained.

This is not a paper on effects-based planning (EBP), effects-based operations (EBO), nor any of their related controversial topics. However, when discussing the result of military activity, the planner cannot blithely assume that the outcome will always be to obtain some specified objective. That may be the goal, but it is circular reasoning to assume it. What is unquestionable is that there will be some results from the military activity. Here, the dictionary definition of “effect” fits better than “results” and will be used without apology. The activity will have effects. They may or may not be tied to an objective; they may or may not be desired; they may or may not have been predicted; they may or may not obtain a desired (or undesired) condition. Asking “What strategic effects may be obtained or should be sought?” is roughly equivalent of asking, “What will be the results of this action?” without implying that the result is any type of end state. The effects question *should* imply that the result may be subjective and qualitative.<sup>26</sup> Lee identifies ten such “strategic effects.”

The most obvious results of military action are *direct military effects*. As indicated already, in most cases, such results do not directly translate into a desired

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<sup>25</sup> Wg. Cdr. Redvers Thomson, “Effects-Based Operations in Air Force Doctrine” (presentation at 75<sup>th</sup> annual meeting of the Military Operations Research Society, Annapolis, MD, June 12, 2007).

<sup>26</sup> Additionally, effects proponents argue that an effect is a *change* to some part of a system; the same implication made by the Lee model. As will be seen, the difficulty lies in determining how that change ultimately matters.

NSES. Unless the result of military action is to occupy the opponent's nation, then there must generally be some decision on the enemy's part to accede to friendly demands before the war will end. The problem is how to get the enemy to make that decision. The other results from military action may influence that process, so broad types of effects must be examined.

Beyond direct military effects, Lee categorizes nine other strategic effects into three groups, roughly corresponding to how closely they lie to the direct effect. Second order effects, understandably enough, are those which can be readily extrapolated from the direct results of military action. Arcane effects are those which may be more hidden, less predictable, but possibly more valuable if they can be anticipated. Coalition effects are more removed still, but no planner since the 2004 Madrid bombing would doubt their importance.<sup>27</sup> Each group will be discussed in greater detail in the following paragraphs.

Second order effects in the model include logistic, economic, psychological, and “C3,” or command, control, and communications. *Logistic effects* indicate the friction introduced into any supply system, military or otherwise, as a result of its being attacked. One can imagine the results of interdiction efforts leading to logistics effects—perhaps the enemy is still able to resupply its troops, but only with greatly increased effort. Thus, the direct military effect may be initially minimal, but the strain placed on the enemy may still be imposing substantial costs.<sup>28</sup>

*Economic effects* may occur in the war sector or across the whole economy, depending on what is attacked. Again, the planner should think about what is desirable,

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<sup>27</sup> Al Goodman, “Spain plans quick pullout of Iraq,” CNN.com, April 19, 2004, <http://www.cnn.com/2004/WORLD/europe/04/18/spain.withdraw/> (accessed 21 March 2009).

<sup>28</sup> Clausewitz, *On War*, 119. “Iron will-power can overcome this friction; it pulverizes every obstacle, but of course it wears down the machine as well.”

and *why*. Attacks on aircraft production, for example, could eventually have direct military effect, but may impose greater costs because of the economic drain to reconstruct the line. Alternatively, an attack on military production means may be sought as part of a “disablement” strategy.<sup>29</sup> Attacks on the broader economy were proposed by the Air Corps Tactical School prior to WWII as a way to dramatically shorten the war. Such a strategy may have a specific political endgame in mind, but as WWII showed, industrial economies are remarkably robust.<sup>30</sup> Modern sensibilities, and modern views of the law of armed conflict, may proscribe large scale attacks on national economic means. Nonetheless, it is certainly plausible that an adversary state will have identifiable, targetable economic nodes whose attack will lead towards the desired political endgame.<sup>31</sup>

*Psychological effects* include such concepts as Warden’s “paralysis,” Pape’s “denial,” and Cebrowski’s “lockout.”<sup>32</sup> More generally, psychological effects at the strategic level are exactly as implied—the effect is on the mind of the enemy regime. Psychological effects provide a glimpse of the problem to be addressed in tying military objectives to political aims: modern militaries have demonstrated robustly that they are

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<sup>29</sup> Disablement is the concept of simply removing the enemy’s capability to do something, regardless of his desires.

<sup>30</sup> Franklin D’Olier, et al, *The United States Strategic Bombing Survey Summary Report (European War)* (publisher unspecified, presumably Washington, DC: US Government Printing Office, 1945), <http://www.anesi.com/ussbs02.htm> (accessed 16 March 2009), 2. Hereinafter, *US Strategic Bombing Survey*.

<sup>31</sup> This should not be misconstrued to imply there is no value in attacking economic targets. The effects obtained at the operational level of war may still be extraordinarily useful to the military campaign, particularly in such areas as electrical production/distribution and petroleum refining/distribution. Although USAF doctrine classifies such attacks as “strategic,” they are beyond the scope of this thesis.

<sup>32</sup> *Denial* is the concept that attacking an adversary’s means to wage war is the most appropriate way to affect his will, and that indirect approaches are unlikely to succeed. A criticism is that the concept fails to account for an adversary’s ability to reassess following any type of attacks. In contrast, *lockout* is the concept that an adversary may recognize he no longer has any viable options, at which point he must reassess his actions. See Major John P McDonnell, USAF; Major Keith Detwiler, USA; and Lieutenant Colonel Rex Gibson, USAF, “From Strategic Effects to Desired End State: Applying the Lee Model to an Interagency Process,” Joint and Combined Warfighting School paper, Joint Forces Staff College, 2002.

capable of inflicting psychological effects on enemy leaders. During Iraqi Freedom, “shock and awe” was widely interpreted as an effort to reprise the effect in Desert Storm that Saddam Hussein, reportedly, was near a nervous breakdown prior to the cessation of hostilities. But, reprise it to what end?<sup>33</sup>

Arcane effects are those typically hidden from direct observation. These include political, strategic choice, resource allocation, and treasure effects.

*Political effects* impact which individuals have influence within the enemy regime. The most extreme example of this effect is governmental decapitation, which, of course, should lead to questions about likely succession. Other examples depend not only on intelligence and the type of political regime under consideration, but also on common sense. If the enemy leader values the council of his air defense commander, obliterating enemy air defenses offers an obvious approach to discrediting that council, in addition to the purely military value of the attack. If intelligence determines that a trusted advisor has assured the leader an attack in an area is not forthcoming, an attack on that area may gain heightened significance.

The *strategic choice* effect may be one of the most powerful of all. Notably, this effect includes the concept of strategic misdirection or strategic blunder. The Battle of Britain is the classic example. The Luftwaffe had great success against British airfields, and was very near obtaining air supremacy over Britain, as a prelude to invasion. When the Royal Air Force (RAF) bombed Berlin in response, they achieved very little in direct military effect. However, an enraged Hitler ordered the Luftwaffe to change targets,

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<sup>33</sup> This is not to suggest that the military plan for Operation Iraqi Freedom failed to explain the purpose of “shock and awe,” but rather to highlight that this connection was not made in popular thought. For widely differing interpretations, see Gordon, *Cobra II*, 36, 44; Bob Woodward, *Plan of Attack* (New York: Simon and Schuster, 2004), 102; and Williamson Murray and Robert H. Scales, Jr, *The Iraq War* (Cambridge: Harvard University Press, 2003), 166-167.

attacking British cities in reprisal. The attacks on RAF airfields stopped, and they were able to reconstitute and again challenge the Germans for air superiority, this time successfully. Deprived of air superiority, Hitler called off his cross-channel invasion, instead attacking Russia before completing the capture of an unsinkable aircraft carrier off the European coast.<sup>34</sup>

More interesting, and more subtle, is an unplanned result from the Allied strategic bombing campaign—a *resource allocation effect*. It is clear that many of the targets recommended by the Air Corps Tactical School (ACTS) were, in retrospect, completely useless. Germany had more ball bearings on hand than it could use in years. Unfortunately, the ACTS also incorrectly assessed the German electric grid as very robust. In fact, historians believe it could have been shattered with far less effort than thought at the time.<sup>35</sup> German aircraft production continued to increase until the end of the war, despite Allied bombing—but, of course, there were no pilots to fly the aircraft, and no fuel for them. Nevertheless, a student of military history may be forgiven for wondering whether the effort expended in strategic bombing obtained proportional results. The attempt to obtain an economic effect seems to have failed.

Examining the results from a resource allocation perspective, however, suggests a different answer. It is common knowledge among airmen that the 88 mm anti-aircraft gun was a grave threat to Allied bombers. Less well understood is the designed use for the 88 mm gun—as an anti-tank weapon. Fully 40% of German 88 mm production was allocated to the anti-aircraft role to counter the bombing offensive—even before considering the damage caused by a single bomb. Regardless of which role would have

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<sup>34</sup> John A. Warden III, *The Air Campaign*, rev. ed. (San Jose: toExcel, 2000), 103.

<sup>35</sup> *US Strategic Bombing Survey*, 14.

ultimately better served Germany's defense, the bombing forced a resource allocation decision. Additionally, Germany's decision to keep producing fighters for which there were no pilots would clearly be considered an example of resource *misallocation*.<sup>36</sup>

The treasure effect results from an adversary cherishing something greatly beyond its rational value. Lee presents an example that the Japanese government, at the end of World War II, was extremely concerned that certain royal imperial regalia would be captured by the US and its allies, and specifically sought assurances they would not be seized after their surrender. Certainly, many nations could be expected to place inordinate value on various cultural monuments, although the laws of armed conflict would generally proscribe attacking such items. The key with a treasure effect is not so much simply targeting something that the adversary *values*. If that were the case, the "Crossed Swords" monument in Baghdad might have been considered a legitimate target, even though it had no military value. Rather, the adversary must value it to such an extent that he will *substantially change his behavior in order to protect it*.

There is some evidence that President Johnson believed Ho Chi Minh treasured the small North Vietnamese industrial complex and believed he would do almost anything to avoid its destruction.<sup>37</sup> Unfortunately for the US strategy, although Ho valued his infrastructure, he did not have the emotional attachment the President inferred. An important consideration for a treasure effect is that *the item may have no intrinsic value*—whether North Vietnam's industrial capability, or North Korea's nuclear capability, both *have* value. This suggests neither would be the sort of target that a leader would do anything to save. That which has a price can be rebuilt.

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<sup>36</sup> Ibid, 7.

<sup>37</sup> Robert A. Pape, *Bombing to Win* (Ithaca: Cornell University Press, 1996), 178.

The final type of effect in the model is the coalition effect. Refreshingly familiar after examining arcane effects, driving a wedge between coalition members has a long, and often successful, history. From Napoleon's destruction of the first five coalitions facing his French Empire to modern Al Qaeda attacking London and Madrid, splitting nation states plays upon the common sense notion that each have different aims and different costs they are willing to bear. The coalition effect may also be sought within a nation state, by targeting political coalitions within government or society.

These ten types of strategic effects seem to categorize the range of results to be expected from military action. They should, at least, suffice for this approach.

**Table 2. Strategic effects in Lee model**

Lee Theory of Victory Model: Ten Strategic Effects	
#1 - Direct military effects	#2 – Logistic
- Second order effects	#3 – Economic
	#4 – Psychological
	#5 -- C3
	#6 – Political
- Arcane (hidden) effects	#7 -- Resource allocation
	#8 -- Strategic choice
	#9 – Treasure
#10 - Coalition effects	

Strategic effects are not obtained as an end unto themselves. Rather, to have any value, they must be obtained for a purpose. That purpose, ultimately, is to create change in the adversary's political system. Thus, it follows that the next step is to examine the enemy's political reaction.

The enemy political reaction is the response to friendly forces achieving their desired strategic effects. They are the answer to the question, “And then what?” popularized by General Zinni. For the answer to make any sense, the strategist must first understand who the major players are in the enemy’s political system, and what their state of mind is. Is there a balance of power?

What will be the impact of “our” strategic effects on “their” state of mind? What will be the impact on the balance of power? Recall from earlier that an entire category of effect focuses on these impacts. Will the result be shock? Will that shock result in paralysis? If so, for how long, and what will friendly forces seek to accomplish during that period of time?

Alternatively, might the result be resolve, as demonstrated during the London Blitz? Or, will the enemy recognize that their immediate goals have been denied? Will they acknowledge that their goal or preferred course of action has been entirely foreclosed—that they have been “locked out”?<sup>38</sup> Arguably, Pape’s “denial” fails to account for reassessment. Cebrowski’s “lockout” accounts for it, by definition. A thinking enemy who recognizes lockout is already considering alternatives. But, when considering any of these questions, is this thinking enemy a rational actor?

While intelligence can provide the answers to some of these questions, others are extraordinarily difficult to answer. It is not necessary to answer all of them, however, because the point is to frame the ultimate question for the grand strategist: the question of the political endgame. Once that has been answered, a closer reexamination of the political questions may be appropriate.

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<sup>38</sup> David S. Alberts, John J. Garstka, and Frederick P. Stein. *Network Centric Warfare* (Washington, DC: DoD Command and Control Research Program, 1999), 165-166

The ultimate question for the policymaker to address is, “What is the expected *political endgame* in the enemy regime as a result of our actions?” Note, here, that *expected* does not necessarily equate to *desired*, and that neither is deterministic. The point is not to make a prediction; the point is to elicit from the policymaker and strategist how he sees the endeavor playing out.

Obviously, the type of enemy regime and the value of the “object” sought must weigh heavily in this calculation, but Lee offers four likely political endgames: bitter end, rational calculation, internal political shift, and imploding Clausewitzian triangle. This research suggests a fifth may also exist, the “managed problem.” If the policymaker and grand strategist can both understand which of these divergent political endgames is envisioned, they will have taken the first step towards a coherent theory of victory for their endeavor.

**Table 3. Political endgames in modified Lee model**

Political Endgames in Enemy Regime	
- Bitter end	
- Rational calculation	
- Internal Political Shift	<i>Includes:</i> election, legislative vote, coup, revolution, non-violent factional struggle
- Imploding Clausewitzian Triangle	
- Managed Problem	

War to the *bitter end* is uncommon, particularly between states. Forty years of Cold War may have obscured this fact, since the policy of mutual assured destruction strongly suggested there would be no quarter given. Although the United States maintained a counterforce policy, few outside the military seemed to appreciate the distinction, and the Soviet Union actually developed biological weapons for follow up

use after its nuclear attacks.<sup>39</sup> The lack of conclusive victory in Korea and Vietnam may have reinforced a myth that wars “should” end decisively, like World War II or even the Peloponnesian War.

However, even World War II Germany did not fight to the bitter end, since it never implemented Hitler’s orders for “scorched earth.” The Spartans might be excused for wondering if Athens should have been razed, since every time the Athenians were defeated, a new war was only decades away.<sup>40</sup> The legendary Roman sack of Carthage stands out as a clear exception to this generalization.

Modern events suggest that a bitter end may be more common intra-state or sub-state, such as the ethnic cleansing in Rwanda, in which the warring parties are not rational actors. Early ideas that the Global War on Terror would be conducted to the bitter end have since been tempered by statements to the effect, “We cannot kill our way to victory.” An interesting question is whether Al Qaeda and its associated movements believe *they* will fight to the bitter end; former Vice President Cheney expressed this question when he stated this is an “existential war” for the West.

The *rational calculation* is Clausewitz’s obvious preferred result, but history is replete with examples—World War I, Vietnam, the Iran-Iraq war, Desert Storm, Israel-Palestine, Iraqi Freedom—demonstrating that it does not occur as often as the word “rational” would indicate. An obvious problem with a rational calculation is calculating the leader’s interests versus the nation’s interests, which do not always coincide.

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<sup>39</sup> Ken Alibek with Stephen Handelman, *Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World—Told from Inside by the Man Who Ran It* (New York: Dell Publishing, 2000), 5-8.

<sup>40</sup> Chester G. Starr, *A History of the Ancient World* (New York: Oxford University Press, 1965), 346. Barely ten years after its defeat in 404 BC, Athens had rebuilt its walls and navy, and joined several other Greek states in challenging Sparta militarily.

Clausewitz also warned of a second problem—the passions of the people running uncontrolled, and driving their government to irrationality.

The third type of endgame is arguably more interesting, more common, and more often available via various elements of national power. The *internal political shift* results from any number of changes inside the adversary's political system, causing a policy change within the adversary government—an election, a legislative vote, a coup, a revolution, or even a non-violent factional struggle. Al Qaeda has made no secret of its desire to influence elections in western nations—most blatantly Spain, but also the United States. Similarly, Russia has, apparently, succeeded in obtaining an internal political shift in Kyrgyzstan, with a legislative vote in Bishkek evicting the United States from Manas air base in that nation.<sup>41</sup>

The United States publicly stated it was interested in a coup ousting Saddam Hussein following Desert Storm. Although separated by centuries, the chaos and violence following the French and Iranian revolutions offer cautionary notes for any government thinking about fomenting a revolution.

The non-violent factional struggle is a more subtle approach, and will be examined later in one of the case studies. As a desired endgame, it seeks to change who has power or influence in the adversary's political system.

The final endgame proposed by the Lee model is the *imploding Clausewitzian triangle*.<sup>42</sup> In the imploding Clausewitzian triangle, the three supporting components—

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<sup>41</sup> Megan K. Stack and Julian E. Barnes, “Kyrgyzstan to close key U.S. air base,” Los Angeles Times online edition (February 4, 2009), <http://www.latimes.com/news/nationworld/world/asia/la-fg-kyrgyzstan-base4-2009feb04,0,6704305.story> (accessed 21 March 2009).

<sup>42</sup> As used at the US Naval War College, the Clausewitzian ‘triangle’ is distinct from the Clausewitzian ‘trinity,’ and refers specifically to the shorthand “the government, the army, and the people.” It is typically used when the ‘trinity’ verbiage does not precisely describe the issue at hand. This is especially the case

the government, the army, and the people—begin to collapse, affecting and dragging down the others in a self-reinforcing death spiral. In the best case scenario, the anarchy of a failed state may result; the worst case may be a multi-sided civil war. Had Iraq devolved into civil war in 2006, history might have recorded it as an imploding Clausewitzian triangle; Rwanda in the 1990's may also be an example. In Iraqi Freedom, both Jordan and Kuwait expressed concerns about Iraq imploding, and the admonition for military forces to plan for “catastrophic success” provides further evidence that this is a real potential outcome.<sup>43</sup>

The fear of such an outcome is a rational calculation of a different kind. Some have argued that just such a fear led World War I Germany's government to sue for peace when it did.<sup>44</sup> After the war, revisionist historians in Germany argued that their government had betrayed the army and the people, but the army's near collapse, the threat of food shortages, and the growing restlessness of the German population may have led the government to fear a total collapse if it had not agreed to an armistice.

This paper proposes a fifth endgame—victory as a *managed problem*. Terrorism writ large, as opposed to terrorism in any nation, is unlikely to ever be eliminated. Similarly, many situations involve using instruments of national power in continuing processes of “building partnership capacity,” shaping, and the like, which will not have a clear finish line.

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when the subject under discussion actually *is* “the government, the army, and the people” as opposed to the trinity’s “rationality, chance, and passion.”

<sup>43</sup> On Iraq imploding, see Michael R. Gordon and Bernard E. Trainor, *Cobra II* (New York: Pantheon Books, 2006), 26; on identifying the possibility of “catastrophic success,” see U.S. Department of Defense, Office of the Assistant Secretary of Defense (Public Affairs) News Transcript, “DoD News Briefing - Secretary Rumsfeld and Gen. Myers,” <http://www.defenselink.mil/transcripts/transcript.aspx?transcriptid=2367> (accessed March 23, 2009). Note that Secretary Rumsfeld’s usage aligns with the campaign planner’s maxim to plan not only for “win, lose, or draw,” but also for “win big.”

<sup>44</sup> Bradford A. Lee, Naval War College, Dept. of Strategy & Policy. Classroom lecture, December 2001. Naval War College, Hewitt Hall, Newport, RI

This endgame could be considered a subset of the internal political shift. However, the sense of an internal political shift is that something supported by a major portion of the adversary's political system changes. Action is taken; a decision is made; an election occurs. In contrast, a *managed problem* suggests the situation has been gradually reduced to the point of continuing acceptability. This is particularly applicable in military "Phase 0" (theater engagement) activities, but may also be a legitimate end game when the problem is so large that solving it is beyond the capacity of any nation or coalition.

The obvious example is famine. A problem that cannot currently be solved does not conveniently remove itself from policymaker's list. For other problems, a long term shift in opinions may be necessary before a solution becomes acceptable to both sides. Israel-Gaza is an example, but US-Venezuelan relations would also qualify. While the United States might actually prefer an internal political shift in Venezuela, stating that as a desired solution could cause serious international repercussions and could be interpreted incorrectly as guidance for near-term actions.

It seems likely that the "managed problem" may be a tempting option, even when it does not accurately describe the political endgame sought. For this to be a meaningful endgame, it must be carefully applied. The entire Modified Lee Framework is reproduced at Appendix D for reference.

The suggestion that an endgame must be acceptable to both sides is crucial. In military parlance, there is a bumper sticker for planners to, "Remember that the enemy gets a vote." In the endgame, however, the enemy actually gets a *veto*. More precisely, the *loser* gets a veto.

Except in the case of a bitter end, the “winner” does not decide when the conflict is over. The loser decides, by acceding to the winner’s terms. Until the loser decides that the current situation is more acceptable than continuing to fight, then the fight continues. It makes no difference whether the combatants are nation-states, religious-based militias, tribes, or terrorist groups.

Afghanistan was not “over” when the Taliban were driven from power, because that group did not accept the new conditions, even if the people did. Iraq was not “over” when Baghdad fell, because various groups took advantage of the situation to advance their agendas in opposition to the U.S. desired endgame.

World War II did end when Germany and Japan surrendered, which suggests that policymakers and planners might need to consider who on the losing side will make the decision to stop fighting. One reason, possibly apocryphal, given for the United States not formally declaring war after the 9/11 attacks was that no one could identify how such a war could be formally ended—that is, who would give the surrender?<sup>45</sup>

This concern is particularly applicable in operations against non-state actors, such as terrorist organizations or insurgencies. Using Afghanistan and Iraq as examples, it seems that the solution is to consider the political endgames for each group or subgroup, peeling off those that can be reconciled to a particular endgame and then imposing a different endgame on others. Ultimately, this could devolve to individuals. When individual terrorists or insurgents decide to stop fighting, for whatever reason, they have accepted an endgame. It is worth the strategist’s time to consider what endgames might

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<sup>45</sup> The more immediate practical problem was that declarations of war are typically made against nation-states, although the U.S. Constitution does not explicitly include such a restriction.

be palatable. This concept aligns with the pragmatic practice of granting amnesties towards the end of insurgencies.

A second factor when considering political endgames is to recognize that *both* sides have desired strategic end states, and *both* sides have a political endgame in mind, even if they have not explicitly thought it through. Thus, part of the planner's calculus must consider what will cause the adversary to move away from its desired political endgame and accede to the planner's desired political endgame.<sup>46</sup>

Although it is simplest to first explore the modified Lee model in order, there does not appear to be any restriction against working through the model backwards, starting at a discussion of the desired political endgame.<sup>47</sup> Even a conversation which jumps between topics, with a policymaker musing about effects, political reactions, and how the instruments could be applied, might well be the outline of a vision.

Given only a single question to the policymaker, the strategist could do worse than to ask, “What is the political endgame?”

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<sup>46</sup> Applying this concept to the disablement strategy addressed earlier, disablement becomes a form of rational calculation. The policymaker assumes that both sides will act rationally, based on the limited objectives sought, even if the adversary is discontented.

<sup>47</sup> Backwards planning may be more difficult, however. The advantage of proceeding forward through the Lee model is that it utilizes the policymaker's intuitive sense that actions will lead towards the goal. The policymaker describes, in the end state, what he wants the world to look like when the action is done, but identifying the penultimate state seems harder. (This difficulty is one argument against applying “effects-based thinking” to “open systems.”)

## CHAPTER 2

### DIMEFIL ON PMESII

If a strategic theory of victory is useful to the policymaker, the operational planner looks for a way to match the available elements of national power to the appropriate elements in the adversary’s “system.” As before, it is critical to state terms precisely, so there is no ambiguity.

The term “system,” as used, does not imply or require infinite knowledge of all moving parts. Rather, as described in JP 5, it refers to systems-based thinking.<sup>48</sup> That is, things have cause and effect, whether or not that cause and effect is understood. Things have supporting elements, whether or not their linkages are known. Meade did not appear at Gettysburg by magic; he marched there. Flies do not appear from broth; they hatch from eggs. Ebola does not have a natural reservoir in Nebraska; an outbreak in Omaha is not a natural event, is not divine intervention, and did arrive from somewhere.

The “PMESII” construct provides a useful way to outline the enemy’s “system.” This paper makes no claim it is the best, or even preferred, construct. Rather, it is a reasonably well-known model that works for this analysis. Breaking down the components of friendly, allied, neutral, or adversary “systems” into Political, Military, Economic, Social, Infrastructure, and Information elements appears to roughly encompass all their major aspects, whether for a nation-state, ethnic or religious group, tribe, or terrorist organization.

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<sup>48</sup> U.S. Joint Chiefs of Staff, *Joint Publication 5-0: Joint Operation Planning* (Washington, DC: Government Printing Office, 26 December 2006), III-16 - III-18.

In general, the planner applies friendly elements of national power against the various elements of the PMESII construct. The Diplomatic, Informational, Military, and Economic elements of the DIME model are well-accepted. Problems occur, however, when attempting to assign lead government agencies to problems beyond conventional warfare. When the goal is to freeze terrorist financial assets, a different agency will probably have lead than when the goal is to help rebuild a defeated adversary's economy. The planner looking for assistance in reconstituting an adversary's judicial system might reasonably ask whether the Department of Justice should be involved, and whether that fits in the classic DIME model. If the goal is to institute intelligence sharing between homeland security agencies as part of an engagement plan, the US Department of Homeland Security (DHS) might well object to this being classified as D or M.

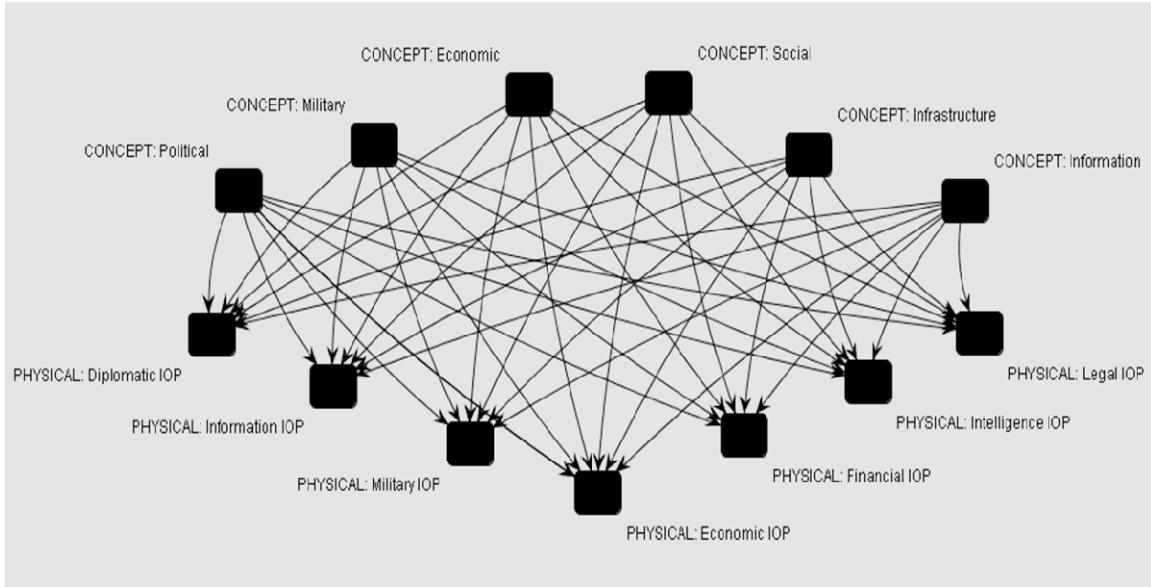
Thus, the DIMEFIL model for instruments of national power seems more appropriate, adding Financial, Intelligence, and Legal instruments of national power to the traditional four.<sup>49</sup> In the vernacular, “our” DIMEFIL instruments of national power are applied against “their” PMESII elements. Similarly, the adversary is matching “their” DIMEFIL instruments against “our” PMESII elements.<sup>50</sup>

Figure 1 shows a conceptual model of DIMEFIL activities mapped against PMESII elements. As noted in the introduction, the most striking aspect of such a diagram is the large number of interconnections that a plan may involve. These are real-world interactions, whether the plan explicitly accounts for them or not.

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<sup>49</sup> U.S. Joint Chiefs of Staff, Chairman, *National Military Strategic Plan for the War on Terrorism* (Washington DC: Government Printing Office, 1 February 2006), 6.

<sup>50</sup> An applicable question, but not specifically addressed here, is how a domestic agency, such as DHS, might apply “our” DIMEFIL against “our” PMESII.



**Figure 1. DIMEFIL on PMESII model.**

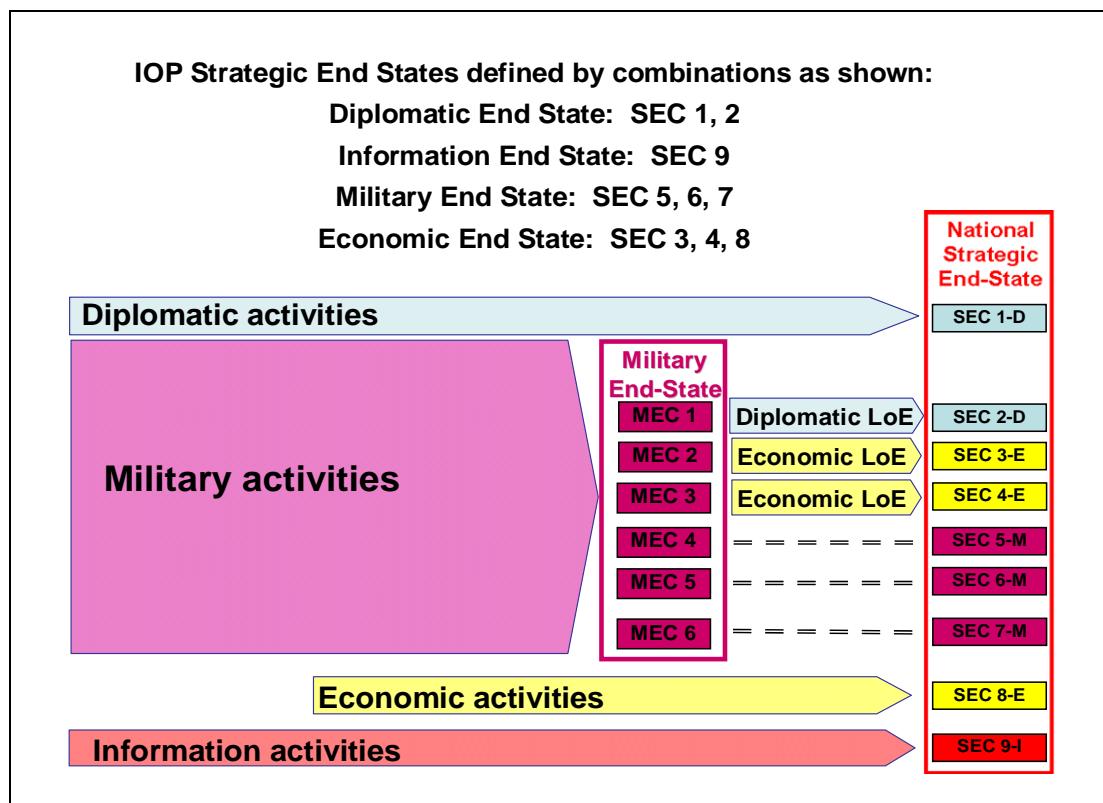
The figure is built using a software tool called *Athena*, which will be further explored in Chapter 4. The tool is a “dependency analyzer;” it identifies “nodes” that are extraordinarily dependent on others, or that others highly depend on. The arrow direction for each link in figure 1 indicates dependency, not activity flow. That is, a change to the Political element of PMESII “depends on” DIMEFIL activities occurring. The model does not know this; the arrow indicates that the planner believes it to be true. While somewhat self evident, the point is nevertheless worth emphasizing: this “model” is nothing more than a reflection of what the planner believes about the situation and has written down. The model—the figure—simply shows it for him.<sup>51</sup>

Typical campaign design models that use DIMEFIL (or similar) generally map various “end-state conditions” which, together, constitute the overall end-state for the

<sup>51</sup> The figure also shows that the planner has identified the DIMEFIL activity nodes as “physical” and PMESII element nodes as “concepts.” Employing the instruments of national power generally involves real-world (i.e. physical) activities. The PMESII construct is a concept, but more importantly, grouping real-world objects under a particular PMESII element is conceptual. The underlying reason for the planner’s choice is that *Athena* associates verbs with the links connecting different node types. The verbs help the planner keep track of the direction of a dependency and the underlying reason that dependency is believed to exist. Using them in the tool is optional.

level under consideration. That is, various *strategic end-state* conditions (SEC), in combination, equate to the *national strategic end-state*. Various *military end-state conditions* (MEC), in combination, form the overall *military end-state*. A similar pattern defines the overall end-states for each of the other elements.<sup>52</sup> Different models use various terms, but the differences are not pertinent here. However, it is important to decide how the end-states will be defined—by the elements of national power applied to them (DIMEFIL), the elements of the system (PMESII), or some hybrid.

There does not yet appear to be a single best approach to this definition. As shown in Figure 2, Thompson defines the end state conditions using the DIMEFIL element expected to lead the effort towards that end state condition.



**Figure 2. Strategic End States for Instruments of Power.**  
**Source:** Thomson, “Effects-Based Operations in Air Force Doctrine.”

<sup>52</sup> Thomson, “Effects-Based Operations in Air Force Doctrine.”

JP 5-0 is agnostic; it simply identifies “national strategic objectives” without reference to any underlying construct.<sup>53</sup> This is in keeping with its flexible approach to organizing the underlying lines of operation that will obtain the objectives. The advantage of this flexible approach is that it allows tailoring to the type of operation envisioned. This paper, however, will use the PMESII construct, since the point of PMESII is to help ensure the planner does not overlook key parts of the desired NSES.

Regardless of the approach taken to defining the end state conditions, the steps necessary to achieve them are generally laid out during “campaign design” and lines of operation constructed to connect, sequence, and synchronize the steps.<sup>54</sup> To distinguish between physical and conceptual lines of operation, different terms have been adopted, including “logical lines of operation” (variously abbreviated LLO, LLOO, or simply logical LOO), “lines of effect” (LOE), and “lines of effort.”<sup>55</sup> The “lines” approach provides an overall conceptual map for subordinates to use in sequencing their planned activities into the overall plan; this paper will use LLO for simplicity, without arguing the merits. (While the term “logical lines of operation” gained traction with its incorporation into FM 3-24, and “lines of effect” has become less popular, the latter may have a more common-sense usage outside the military. It is not yet known how the Army’s new preference, “lines of effort” will be received by the joint and interagency community.)

This process is being used in both Iraq and Afghanistan. In Iraq, similar approaches were used by III Corps and XVIII Airborne Corps during their assignment as

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<sup>53</sup> *Joint Publication 5-0: Joint Operation Planning*, IV-22 fig. IV-7.

<sup>54</sup> *Ibid*, IV-19.

<sup>55</sup> U.S. Army, Secretary of the Army, *Field Manual 3-0 Operations* (Washington DC: Government Printing Office, February, 2008), 6-13, D-4. Lines of effort is the term adopted by the new FM 3-0 to replace Logical Lines of Operation, but has not (yet) been adopted by the joint community.

the headquarters, Multi-National Corps-Iraq (MNC-I), but the differences bear considerably on the model proposed here.

Notably, neither Corps took a rigorous approach, that is, an approach based on an underlying framework such as PMESII or DIMEFIL. Yet, both arrived at plans sufficient to publish. That suggests the concept of LLOs leading to desired end state conditions is useful and practical. However, that lack of rigor also led to some planners not understanding how their piece fit into the bigger picture, which slowed planning and led to rework.<sup>56</sup>

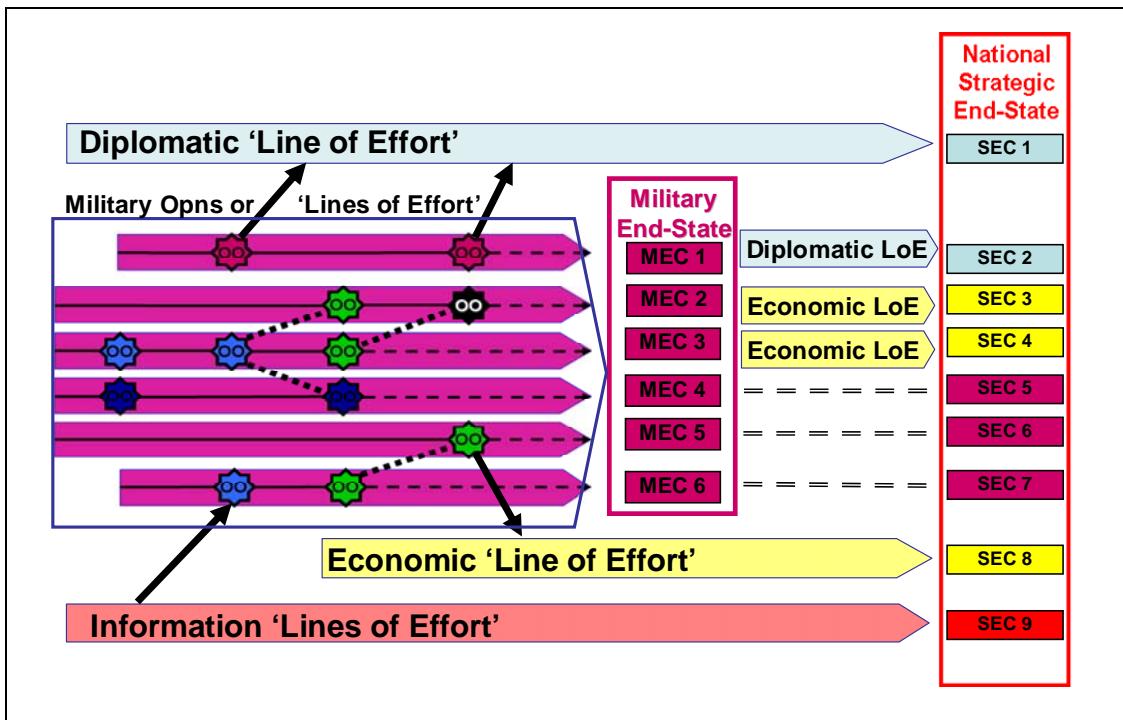
Organizing the LLOs requires the same thinking as organizing the end-state conditions. Here, there is even less agreement. JP 5-0 merely offers a list of suggestions (by organization, by objective, by function) as alternatives to using the instruments of national power. FM 3-24 offers a list that may be appropriate for counterinsurgency or Phase IV operations: conduct combat operations/civil security operations; train and employ HN security forces; establish or restore essential services; support development of better governance; support economic development.<sup>57</sup> Dr. Jack Kem, of the US Army's Combined Arms Center, suggests they should not be organized around instruments of national power, but rather around "ways," that is, they "provide the ways to apply the means to achieve the ends."<sup>58</sup> This paper will use DIMEFIL because it has generic applicability.

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<sup>56</sup> The author was assigned to MNC-I while both III Corps and XVIII Airborne Corps were the headquarters element, and had the opportunity to observe and participate in building operations orders that each of them published.

<sup>57</sup> U.S. Army, Secretary of the Army, *FM 3-24, MCWP 3-33.5, Counterinsurgency* (Washington, DC: Government Printing Office, December 2006), para. 5-16.

<sup>58</sup> Jack Kem, "Much Ado about LLOO," Reflections from Dr. Jack blog, US Army Combined Arms Center Blog Library, entry posted December 5, 2008, <http://usacac.leavenworth.army.mil/BLOG/blogs/reflectionsfromfront/archive/2008/12/05/much-ado-about-lloo.aspx> (accessed March 23, 2009).



**Figure 3. Identifying Logical Lines of Operation (LLO) or Lines of Effort (LOE) for Instruments of National Power.**

*Source:* Thomson, “Effects-Based Operations in Air Force Doctrine.”

Regardless of the method chosen to organize the campaign, the first problem left for planners at all levels is that a campaign is an inherently complex entity; its plan, by extension, is large, complex, even cumbersome. Efforts to “improve” the process with constructs such as DIMEFIL/PMESII do not reduce the problem. They simply lead to a large number of objectives or effects statements. These are difficult to monitor and track, which leads to pushback.

A second problem with using DIMEFIL/PMESII is that it leads to a static plan, an argument that can probably be made against most planning constructs. It is difficult to trace the impacts of any change to the plan, because there is simply too much in the plan to consider, and doing so takes up too much time.

This static-plan problem was neatly summed up by the arguments for and against adaptive planning as a replacement for deliberate planning. Deliberate plans contain facts and threat data which may be years out of date, simply because the data must be frozen at some point in order to continue planning. Yet, by definition, this means any finished product has questionable utility to the leadership. Any new data which changes any fact or assumption, in theory, invalidates the plan.<sup>59</sup>

If the argument against this conclusion is that the data probably will not change (much), and the changes probably will not affect the plan (much), then the response to that argument is that, theoretically, changing the data should not require (much) rework. Even if true, however, the sheer size of any plan makes this difficult to prove.<sup>60</sup>

A third problem with a DIMEFIL on PMESII construct is that it leads to cause and effect arguments during execution and when changes occur, since the reasoning is not captured ahead of time. The planners, in all likelihood, knew their reasoning, but there is no place in a military style plan for them to explain why they believe activity X should lead to result Y. This is not an argument in favor of a statistical, hard-science cause and effect, but rather, a social science argument.

As a single example, consider the question: “Why is violence down in Iraq?” To many in the military, the answer seems obvious: the surge in 2007 worked. By creating security, the military was able to calm Iraq, which led, in turn, to increased security. A self-reinforcing spiral ensued. To opponents of the surge, the military simply

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<sup>59</sup> A changed military assumption, i.e. an assumption proven to be incorrect, would lead to a branch plan, but creating the branch may take as much time as creating the original.

<sup>60</sup> The sheer size of a plan also makes coordination a lengthy process. Adaptive planning timelines are now limited by the amount of time required to coordinate the plan through the staff, not by how quickly the planners can adjust. Such a problem further argues for a way to capture the reasoning contained in a change without rereading the whole plan.

exacerbated the problem. They argue that violence went down because of the Sunni awakening. Atrocities committed by Al Qaeda in Iraq led to disillusionment by the sheiks, who concluded it was better to support their government. The coalition simply got in the way. A third view is that the Iraqi stared into the abyss of civil war and concluded they were not yet that desperate.

A reasonable response is, “Could it be a combination of all three?” While certainly possible, it is also possible this conclusion is a post hoc fallacy at best, and wishful thinking at worst. The planner arguing for some combination would appear to have a much stronger case if that reasoning had been specifically identified beforehand. At the very least, that reasoning would have been exposed to examination, and possibly data obtained to support (or refute) it.

An additional advantage of capturing this reasoning, beforehand, is that doing so ensures the reasoning on cause and effect is not self-selected. In hindsight, it is easy to construct “reasonable” theories about what worked and why. But, after the fact, no planner is going to construct a theory that leads to a different result than that which actually obtained. Had it been considered beforehand, that theory may have seemed perfectly reasonable, but if it is not *captured* beforehand, there will be nothing to suggest that it ever existed. Nothing will indicate that the planning staff ever had faulty logic. So, reasonable people may be suspicious of claims that, ‘This was the plan all along.’

The last problem leads directly from the absence of captured logic. In MNC-I, the implicit assumptions made by the III Corps planners and the logic within the III Corps plan were not always obvious to their replacements.<sup>61</sup> III Corps had published a plan (OPORD 08-01) just prior to being relieved by XVIII Airborne Corps in order to reduce

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<sup>61</sup> The author was assigned to MNC-I headquarters during the III Corps/XVIII Airborne Corps RIP/TOA.

the immediate planning pressure on their replacements. XVIII Airborne's actions following transfer of authority—to immediately begin work on a new OPORD 08-02—suggests, at least, that it would be more satisfied with a product whose nuances it completely understood. Naturally, personalities may have played a substantial part in this decision, but that simply argues in favor of a planning construct that can be more easily understood and shared.

Many tools have been proposed to assist with this problem. These range from mental constructs, to handbooks, to software. As described, the problem with mental constructs and handbooks is that they do nothing to help handle the enormous amounts of data required by a military plan. The problem with most software tools is that they are focused on applying algorithms to massive amounts of data in order to provide a “right” answer. The data requirements are, too often, utterly impractical. Thus, the algorithms are, at best, suspect. At worst, without the data they require, the algorithms simply provide no useful answers at all. In general, such tools have failed to demonstrate their real-world utility.<sup>62</sup>

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<sup>62</sup> General J.N. Mattis, Commander, USJFCOM, “Assessment of Effects Based Operations,” Memorandum to U.S. Joint Forces Command, 14 August 2008.

## CHAPTER 3

### TYING THE LEE FRAMEWORK TO DIMEFIL/PMESII

For the policymaker, the problem is to determine a desired NSES and accurately communicate it to the planner. For the planner—the strategist—the first problem is to ensure a desired NSES exists.<sup>63</sup> The second problem is creating a plan to obtain it, living within all the restrictions—explicit and implied—that the policymaker sets forth. When reality intrudes, the strategist desires a plan that can be readily understood and readily adapted, so the policymaker can approve the change and the operator can execute the current intent.

The modified Lee model described various political endgames available to the policymaker, and provided a high-level structure for the policymaker to use in thinking about that endgame. In particular, it provided a set of strategic effects for the policymaker to consider—essentially, shorthand to describe the various things that military action may be able to accomplish. In between, it provided a placeholder to discuss the connecting “how?” *How* will obtaining these results reasonably lead to obtaining this desired NSES?

In military terms, “how” typically refers to courses or action, or “ways,” which ideally should be left to lower echelons to design. Again, that is not the term described here. Rather, the intent is for the highest military leadership and the highest policymakers to agree, generally, on what the world will look like when the military

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<sup>63</sup> *Joint Publication 5-0: Joint Operation Planning*, III-5.

action is over, so that commander's intent—more precisely, Commander-In-Chief's intent—will be accurately conveyed.<sup>64</sup>

For the military planner (or a whole-of-government planner), the problem is, at once, simpler and more complex. If the desired NSES is given; the problem is orchestrating the instruments of national power—DIMEFIL—against the adversary, in order to obtain the world described; that is, to make the adversary PMESII match the desired NSES. If no desired NSES is clear, the planner has many options, but ultimately, they all come down to either obtaining an NSES from some higher authority or assuming one.

For both groups, then, the modified Lee model offers utility, in that it can, very quickly, describe the desired NSES in terms of the political endgame and describe how that endgame will be sought. The remaining problems, then, are threefold: 1) how and where to record that logic, 2) how to tie the desired NSES and the logic to DIMEFIL activities, and 3) how to record the adversary's shift from his preferred NSES to the friendly NSES.

The latter two problems can be approached together as a part of campaign planning. If a military objective has various end-state conditions that describe it *in toto*, then the desired NSES can be considered nothing more than the ultimate objective. The defining end-state conditions for the “political endgame in the enemy regime” are the changes to the status quo which will bring about that endgame. These are either changes to the enemy leader's calculus about his desired NSES or they are changes within the enemy system resulting from the “enemy political reaction.”

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<sup>64</sup> Ibid, II-1.

For this purpose, the *P* in PMESII is paramount; the others either persuade the enemy leader to move in the desired direction, they convince him to hold fast, or they have no bearing on his decision. All the strategic effects brought about by all the DIMEFIL instruments, against all the PMESII elements, have but one goal: to move the adversary leader from his desired NSES to accepting the inevitability of the friendly desired NSES. This is the very definition of the rational calculation endgame.

Even if the planner does not expect rational calculation to be the political endgame, the political reaction still governs, in that it connects the strategic effects to the endgame. Whether it is the leader, a legislature, or conspirators, the group in power or taking power makes the decision to continue resisting or accede. Thus, the Political element will always have special place. In fact, it will tie DIMEFIL/PMESII to the modified Lee model.

If the goal is regime change, then for the adversary leader, the friendly political endgame is effectively bitter end. In that case, two options appear practical to get the adversary leader to accept the friendly NSES in lieu of his own. The first is to heed Sun Tzu’s advice not to make the enemy fight on “death ground,” but instead to offer a “road to safety,” perhaps into exile.<sup>65</sup> The second is to recognize that the adversary leader must be eliminated—killed or captured—as soon as possible, whether by friendly forces or as a result of actors in the adversary’s system undertaking an internal political shift (e.g. a coup). Either option effectively turns a bitter end into an internal political shift. The only difference is the participation, political or otherwise, of friendly actors.

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<sup>65</sup> Sun Tzu, trans. by Samuel B. Griffith, *The Art of War* (London: Oxford University Press, 1971), 110. The quoted phrase is actually by Tu Mu commenting on, “To a surrounded enemy, you must leave a way of escape,” 109. Scipio’s similar “golden bridge” is commonly misattributed to Sun Tzu.

Given modern sensibilities and post-World War II law of armed conflict, it appears unlikely an imploding Clausewitzian triangle would ever be the desired political endgame because of the chaos and harm to non-combatants likely to result. Nevertheless, as a possible undesired endgame, the strategist would do well to consider whether it might accidentally result from friendly actions. The precision capabilities of modern airpower might well make this outcome too easily obtained. Arguably, it very nearly happened in Operation Iraqi Freedom, despite the presence of coalition ground forces. An approach to this case might be to simply identify all the conditions necessary for a stable post-conflict environment, and then state them as a negative.

For the managed problem, the value of the object demanded from the adversary is, by definition, lower. This political endgame lends itself readily to conditions statements for all the PMESII elements. In some cases, no change to the adversary's "P" element may even be required, whether the object is positive or negative. That is, the adversary may not mind if the population is fed (a change to E and S), or may not be able to directly respond if the nuclear research facilities are destroyed (a change to M and possibly Infrastructure).

For the problem, "How and where should this logic be recorded?" there are several possibilities. Clearly, it can be recorded within the military plan itself—in an expanded "Concept of Operations" within a CONPLAN, OPLAN, or OPORD. The obvious advantages of this approach are its simplicity and ability to convey a "vision of resolution" to subordinates.<sup>66</sup> The equally obvious disadvantage is that such an exposé may be misinterpreted either as the commander making a deterministic prediction or as specific direction to subordinates. However, it does have clear historical precedent. The

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<sup>66</sup> *Field Manual 3-24, Counterinsurgency*, para 4-19.

George H.W. Bush administration was quite clear when it explained its preferred endgame in Iraq after Operation Desert Storm.<sup>67</sup> It wanted an uprising to remove Saddam Hussein from power. This was an explicit example of an internal political shift, and specifically a change to who had influence in the political system. Unfortunately, the administration made the statement as an overall desire, not as direction in any planning document. Thus, when the uprising occurred and the Iraqi military began using their attack helicopters against the Shia, General Schwartzkopf did not believe he had instructions to stop them.<sup>68</sup>

The logic can also be recorded in a “Pol-Mil” plan, if the national leadership has decided to use that type of vehicle within its National Security Council. A Pol-Mil plan appears to be the preferable choice, since its entire purpose is to provide high-level, whole-of-government guidance. National Defense University makes available a “Generic Political-Military Plan for a Multilateral Complex Contingency Operation,” created by a variety of anonymous authors with former NSC experience. Chapter 4 of the Pol-Mil plan, “Strategic Purpose, Mission, Endstate, and Objectives” specifically includes a section for the “Desired Political-Military Endstate,” effectively the desired NSES.<sup>69</sup> Chapter 5 of the Pol-Mil plan, “Political-Military Strategy,” also lends itself to this type of application. Its “Strategy for Neutralizing the Adversary & Terminating Hostilities” describes the planned process, “to decisively break the adversary’s will, deny him the

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<sup>67</sup> Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, (New York: Houghton Mifflin Company, 1993), 488-489. Specifically, Bush hoped for an Iraqi military uprising, not the Shia and Kurdish uprising that occurred.

<sup>68</sup> Atkinson, *Crusade*, 489-490. By the time the policymakers addressed the helicopter issue, two weeks had passed, and it was no longer a matter of the military end state for Desert Storm. Attacking the helicopters would, by then, have constituted a new, overt policy to support a revolution.

<sup>69</sup> Len Hawley, “Generic Pol-Mil Plan (18 July 2002),” (lecture and course material, Reserve Components National Security Course, National Defense University (NDU) Joint Reserve Affairs Center, January, 2009), [http://www.ndu.edu/jrac/docUploaded/PDD\\_56.pdf](http://www.ndu.edu/jrac/docUploaded/PDD_56.pdf) (accessed March 23, 2009), section 4.3. Hereinafter, Hawley, “Pol-Mil Plan.”

capability, and weaken his staying power to do harm in the region.”<sup>70</sup> It describes how force is to be used in order “to compel the adversary to back down and surrender.”<sup>71</sup> In other words, it describes the theory of victory and political endgame.

There is a third possibility. The logic can be captured in a software tool, where it can be manipulated, displayed, and challenged. That is the subject of the next chapter.

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<sup>70</sup> Ibid, section 5.5.

<sup>71</sup> Ibid, section 5.5.

## CHAPTER 4

### HOLY GRAIL OR WITCHES’ BREW? RECORDING REASONING IN SOFTWARE

The greatest problem with recording reasoning either in a published military plan (e.g. CONPLAN) or in a Pol-Mil plan is that both documents are relatively static. A military plan takes months to approve; the Pol-Mil plan itself says that it will typically take weeks.<sup>72</sup> However, it is not the time, *per se*, that makes the plans static; it is the myriad unstated assumptions that go into them.<sup>73</sup> Every assumption, every crucial fact, and every previous decision leads them down a particular path. When the facts on the ground change, a written document cannot easily show where its author’s logic no longer follows.

As described in Chapter 3, software tools have been proposed to assist with this problem, but have met with little success. The “semantic web” promised software that would be able to understand the content and meaning of documents, not just their format and layout.<sup>74</sup> Unfortunately, while progress has been made, the vision remains unfulfilled. Currently, the most sophisticated tools remain very much in the research realm, and often require software programming skills just to use in the laboratory.<sup>75</sup>

The difficulty in asking software to assist with complex problems is that humans must first formulate the questions, which only afterwards can be translated into code. When the question is poorly understood, the best programmer has no chance of providing

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<sup>72</sup> Ibid, 1.

<sup>73</sup> Here, “unstated assumptions” reflect the many underlying details, not the explicit list of assumptions contained in a military plan.

<sup>74</sup> World Wide Web Consortium, “W3C Semantic Web Activity” (W3C, 1994-2009), <http://www.w3.org/2001/sw/> (accessed March 23, 2009).

<sup>75</sup> See, for example, George A. Miller, et al., “Word Net” (Princeton University Cognitive Science Laboratory, 2006), <http://wordnet.princeton.edu/> (accessed March 23, 2009).

a useful product. A typical solution is to simply utilize the capabilities of software to warehouse data and build products—providing electronic assistance, to be sure, but conceptually little different than paper in filing cabinets, typewriters, and wall charts.

Nevertheless, periodic reexamination of any problem may identify areas where some small breakthrough has occurred, particularly with regard to technology. Airpower tried for 90 years to reliably hit its targets; in the 4-year span between 1999 and 2003, that capability went from difficult and expensive to trivial and cheap.<sup>76</sup> As important, the possibility of success by any given mission went from “doubtful” to “completely expected.” Given the literally exponential rate of increase in computing power, even recent lessons about what is possible may no longer be valid. This chapter examines one tool, to estimate whether certain capabilities may now be within the state of the art.

Recall that the basic problem is twofold: first, there is currently no mental model which links the complex DIMEFIL/PMESII construct to a higher-level desired end state; second, there is no way to keep track of the myriad of DIMEFIL/PMESII activities required by even the simplest of plans. The first part is theoretical—it requires a “theory of victory.” Chapter 1 outlined such a theory, and Chapter 3 tied it to DIMEFIL/PMESII. The second part is practical—a methodology, or perhaps a tool, is needed which will help planners keep track of the reasoning behind each of the various activities. That is the purpose of this analysis.

The caveat stated earlier bears repeating: war is an art. International affairs are an art. Politics is an art. Suggesting a methodology, or a tool, is not an attempt to

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<sup>76</sup> In 1999, during Operation Allied Force, only the B-2 was allowed to employ JDAM because of the limited number available and questions about the new weapon’s effectiveness. By 2003, in Operation Iraqi Freedom, not only JDAM, but also WCMD, was widely employed by a variety of platforms. By 2005, the accuracy had become so completely accepted that smaller warheads were under design to reduce collateral damage—to the point of using concrete instead of high explosives in some cases.

deterministically predict outcomes. In fact, there is not necessarily even any expectation that the planners' reasoning will be correct. Rather, the purpose is to capture the planners' reasoning and make it explicit, so others may question the facts, assumptions, and logic behind each part of the plan.

The Athena software tool, developed by On Target Technologies, is a “general dependency analyzer.” It does not think; it does not have artificial intelligence; it cannot tell the planner whether an answer is right or wrong. It can “reason,” however, based on what a planner (or analyst) has told it. Specifically, it can identify dependencies within a “system” that the planner defines. This system can be as simple and abstract, or as detailed and concrete, as desired.<sup>77</sup>

A *system* is a collection of components that are interconnected in some way.<sup>78</sup> Athena describes these components as nodes, which may be defined as physical objects, actors, or concepts, depending on the question the planner intends to ask.<sup>79</sup> The nodes are connected by links, which describe how the components relate to each other. In any system, connections may range from highly abstract (the interrelationship between the President and Congress, for example) to very concrete (such as the relationship between a water treatment plant and its electrical power provider). In Athena, such connections describe a dependency.

In a causal relationship, the cause-effect mechanism describes how the change in one node creates a change in another node. In a dependency, no change is explicitly required, and the exact mechanism does not need to be specified in order to understand

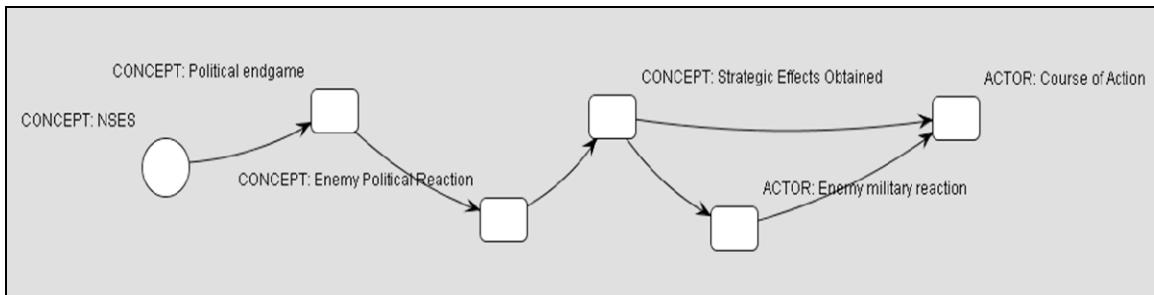
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<sup>77</sup> Brian Drabble, “Inter and Intra-System Network Analysis and Reasoning (Athena),” (project brief, On Target Technologies, LLC, 2/23/2009), para 3.0.

<sup>78</sup> Due to space constraints, this analysis will ignore emergent behaviors within systems.

<sup>79</sup> Brian Drabble and Tim Black, “How to Build a Model in Athena,” (software documentation, On Target Technologies, LLC, 2009), para 2.1

that a dependency exists.<sup>80</sup> This generality is what suggests Athena may have applicability to the problem at hand. Put colloquially, Athena allows questions such as, “If I poke the system here, what else is affected?” The effect that occurs depends on which “poke” is applied. What causal mechanism links the various nodes also depends on the action taken; that mechanism may or may not be known. It may not even be important, although the objective here is to draw it out of the planner.



**Figure 4. High level Lee Model drawn in Athena.**

Athena requires the planner to build system models graphically.<sup>81</sup> Figure 4 shows the highest-level Lee model using the Athena graphical representation. Recall that the arrow indicates the direction of dependency, not activity flow. That is, the figure indicates that obtaining strategic effects *depends on* a course of action being undertaken. The political endgame obtained depends on the enemy political reaction. Although a dependency has a specific semantic meaning within the tool, “depends on” is also the simple grammatical meaning.

Choosing Actor, Concept, or Physical object for the node type does not change the model’s reasoning; it simply allows the planner to construct more coherent dependency statements because of the default verbs available for each node type. For

<sup>80</sup> Drabble, “Inter and Intra-System Network Analysis and Reasoning (Athena)”, para 3.1.

<sup>81</sup> The interface is simple point-and-click to add a node, drag-and-click to draw a link between nodes, right click on any entity to bring up its properties (name, type, etc.).

example, a concept may motivate an actor; an actor may advocate a concept.

Dependencies may be circular; in fact, the developer points to this as an important differentiating capability for their product.<sup>82</sup>

The graphical user interface is designed for the analyst, not the senior leader, and is relatively Spartan. However, unlike the PowerPoint diagram shown in figure 3, the nodes and links here are supported by underlying data, and may be rearranged at will.

The various node shapes allow the user to build a hierarchical model, if desired. They do not affect the model's logic. Although Athena gives each shape a name for use in a hierarchical model (e.g. COG, Target System, etc.), nothing requires the planner to honor those—they are simply text labels.<sup>83</sup>

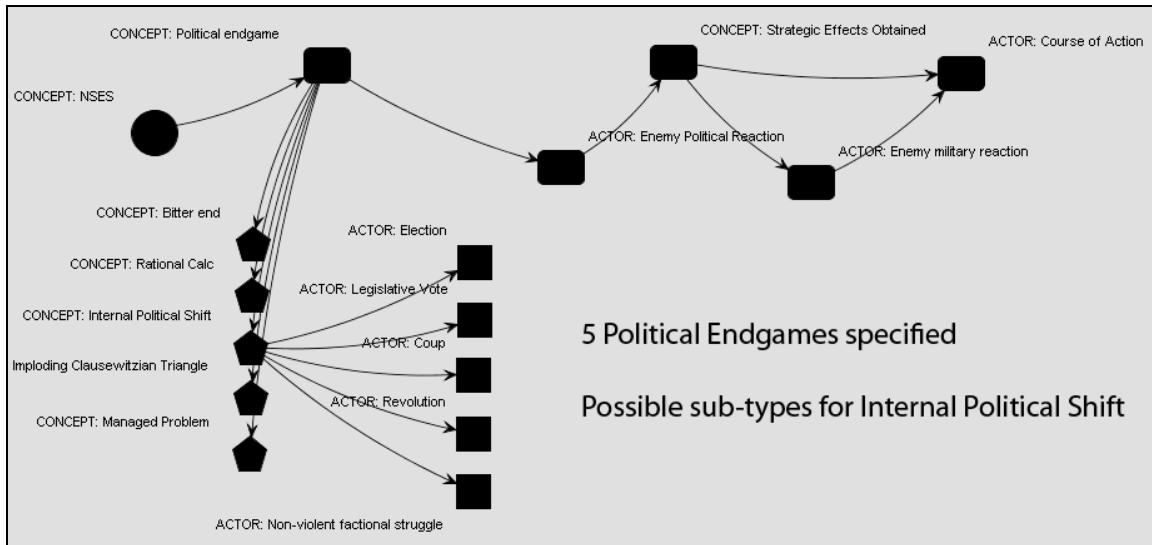
Most importantly, Athena has various algorithms which may be used to analyze the model that the planner has built. The details of each are less important than their purpose: to answer the question, “What have I said is important, here?”

Figure 5 expands a single piece of the high-level Lee model shown in figure 4. It adds the five political endgames, and then further expands one of them, the internal political shift. The model graphically and logically depicts the concept that the planner defines the political endgame by identifying which of the five is desired or expected. For this example, the planner is interested in an internal political shift, and further elucidates various types of shifts for further consideration.

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<sup>82</sup> Ibid.

<sup>83</sup> Most Athena users are interested in analyses of physical systems supported by actors and concepts, so the default terms reflect this construct. The “shape names” are Strategic Entity, COG, Target System, Target Set, and Target. If the user were analyzing the workings of a political system, however, they could just as easily be Legislature, Senate/House, Political Parties, Constituent Groups, Voters.



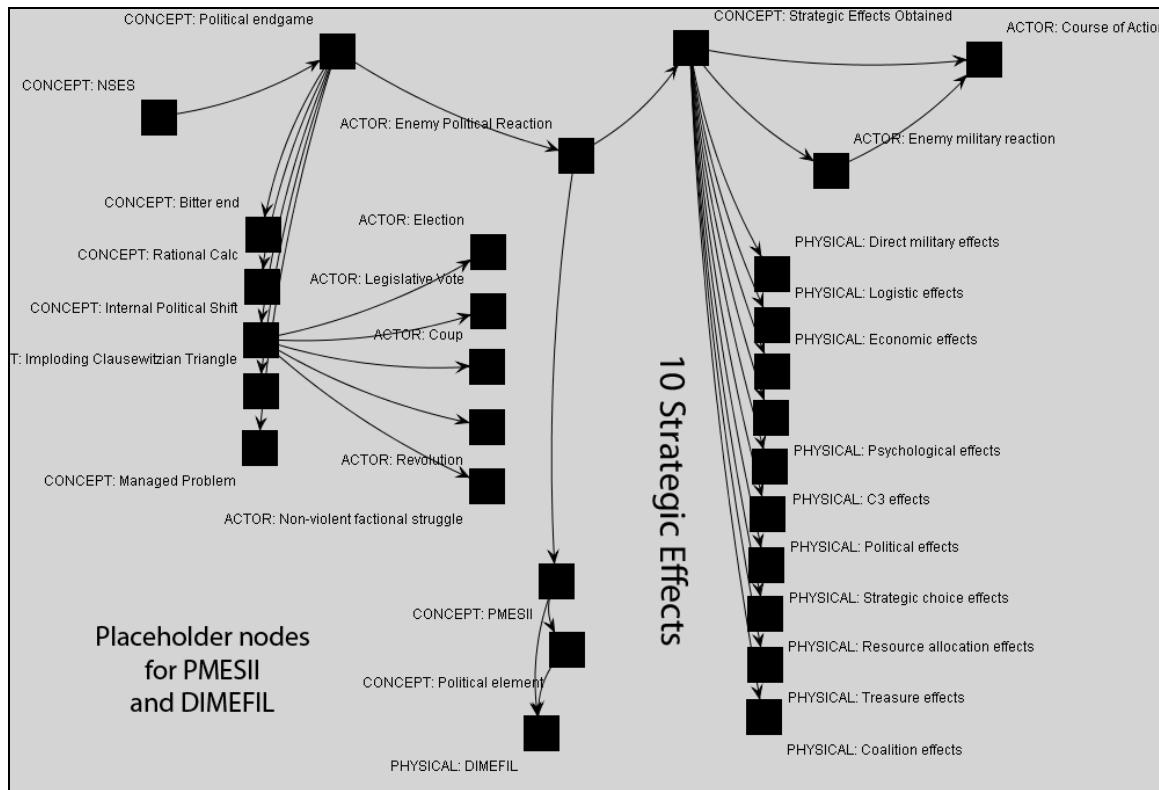
**Figure 5. Lee Model with Political Endgames; Internal Political Shift expanded.**

The figure uses various Athena element shapes simply to illustrate a possible hierarchy. The internal political shift nodes are shown as actors because of the underlying verbs available for the links connecting combinations of actors and concepts.<sup>84</sup>

Figure 6 fills in the model further by adding the 10 previously identified strategic effects and adding placeholders for the enemy political reaction—nodes representing PMESII and DIMEFIL. To this point, the additions are largely pictorial representations of the Lee model from Chapter 1.<sup>85</sup>

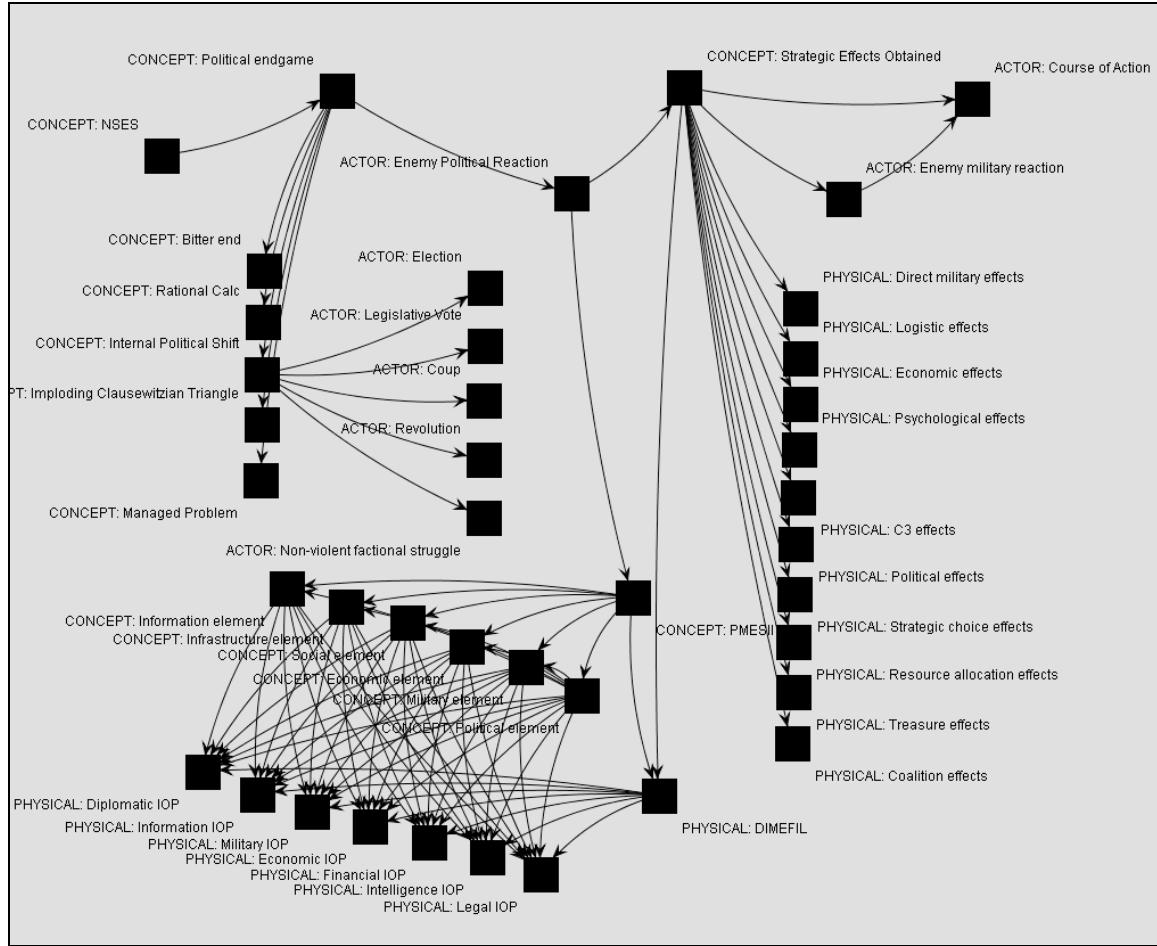
<sup>84</sup> Specifically, an actor *votes* a concept (election and legislative vote links), an actor *implements* a concept (coup), an actor *advocates* a concept (revolution and non-violent factional struggle). An actor might also *accept*, *reject*, *formulate*, or *oppose* a concept using the available defaults. The concept of an internal political shift depends on an actor making it happen. Conversely, concepts can *motivate*, *direct*, or *support the position* of an actor. The verbs do not change the behavior of the algorithms; they are simply available to help a planner understand the thought process behind the dependency.

<sup>85</sup> The shapes are removed in Figure 6 and beyond in order to simplify the figures.



**Figure 6. Lee Model with Strategic Effects and placeholders for DIMEFIL-PMESII.**

Next, in figure 7, the placeholders are replaced with nodes representing each of the PMESII elements and interrelated DIMEFIL activities—the DIMEFIL/PMESII web shown earlier in figure 1. The pictorial representation now shows the Lee model from Chapter 1 and the DIMEFIL/PMESII interconnecting web from Chapter 2. At this point, the model is now complete enough to examine in detail before testing against the thesis. Figure 7 is provided in a larger format at Appendix A.



**Figure 7. Full Lee-DIMEFIL/PMESII Model: Strategic Endgames Model**

The model shown in figure 7 makes a series of statements about the world, which the planner either desires to happen or believes to be true. The enemy system is represented by its PMESII elements, which are subcomponents of the node labeled PMESII. Friendly forces will use DIMEFIL actions to affect the PMESII elements. In this generic model, the planner simply assumes that each of the instruments of national power will be used in some fashion against each of the PMESII elements; hence the completely interconnected web. The planner could choose to assume that changes to the PMESII elements would feed back to change the DIMEFIL activities, but has not done so yet.

The planner could also state that certain DIMEFIL activities will have more or less influence on certain PMESII elements. For simplicity at this early stage, and because the planner has not yet made any particular assumptions about those influences, the default link weights are used. Later, the planner may also add as much, or as little, detail as desired for each of the PMESII elements and contemplated DIMEFIL activities.

Just as the DIMEFIL and PMESII elements represent all the underlying detail of each node, a single node ties together all of DIMEFIL and all of PMESII and then each links to the enemy political reaction. This keeps the model cleaner, and if a planner wants to use mental constructs other than DIMEFIL and PMESII, these “gathering” nodes also indicate where those structures should be attached to the Lee model. As an example of campaign design, a planning team might choose to use PMESII initially as a generic model of the adversary, but then rearrange various elements into named LLO’s once the plan is more complete.<sup>86</sup>

Walking across the top of the model, as discussed in Chapter 3, the tie between DIMEFIL/PMESII and the Lee model occurs at the enemy political reaction. In Athena terminology, the planner believes, and the model indicates, that the enemy political reaction depends on two things: the strategic effects obtained, and the reaction to those effects within PMESII (presumably caused by DIMEFIL actions). As diagrammed, the model also implies that the effects themselves may have some direct bearing on the reaction, perhaps because of how they were obtained. This is indicated by the dependencies from the ‘strategic effects obtained’ node to each of the ten strategic effects themselves.

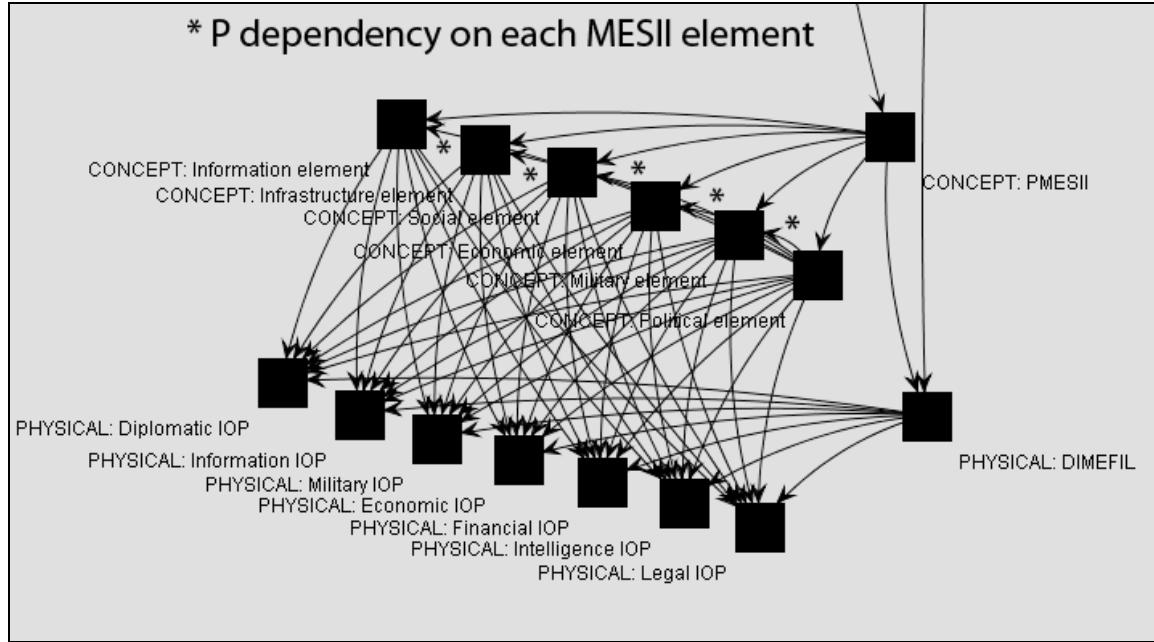
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<sup>86</sup> In the analysis results which follow, these “gathering” nodes are identified as PMESII and DIMEFIL.

The strategic effects are, hopefully, obtained as a result of the friendly military action overcoming the enemy military reaction. So, the strategic effects obtained node depends on both the friendly course of action and enemy military reaction nodes. The enemy military reaction, obviously, depends on friendly activities—which is not the same as saying that the enemy is simply reactive. Rather, it only posits that friendly actions are bound to influence enemy reactions, and vice versa. The influence of the enemy on the friendly COA is not modeled, since the objective is not to wargame, but to see how the resulting effects play out politically.

To complete the examination, as previously indicated, the political endgame depends on the enemy political reaction, and the NSES obtained depends, by definition, on the political endgame that occurs. Whether that is a desired or undesired NSES may depend on which endgame occurs.

There is one final, crucial detail about this model necessary for it to match the concept discussed in Chapter 3. Because the governing element in PMESII is the political element, the P node also depends on each of the MESII nodes. The planner has indicated this by drawing links connecting P to each of MESII, as shown by the close up in figure 8. Again, if there were a reason to believe that some links were more important than others, their weights could be adjusted. A common sense example of this might be a political dictator more concerned about effects on his military than effects on his infrastructure.



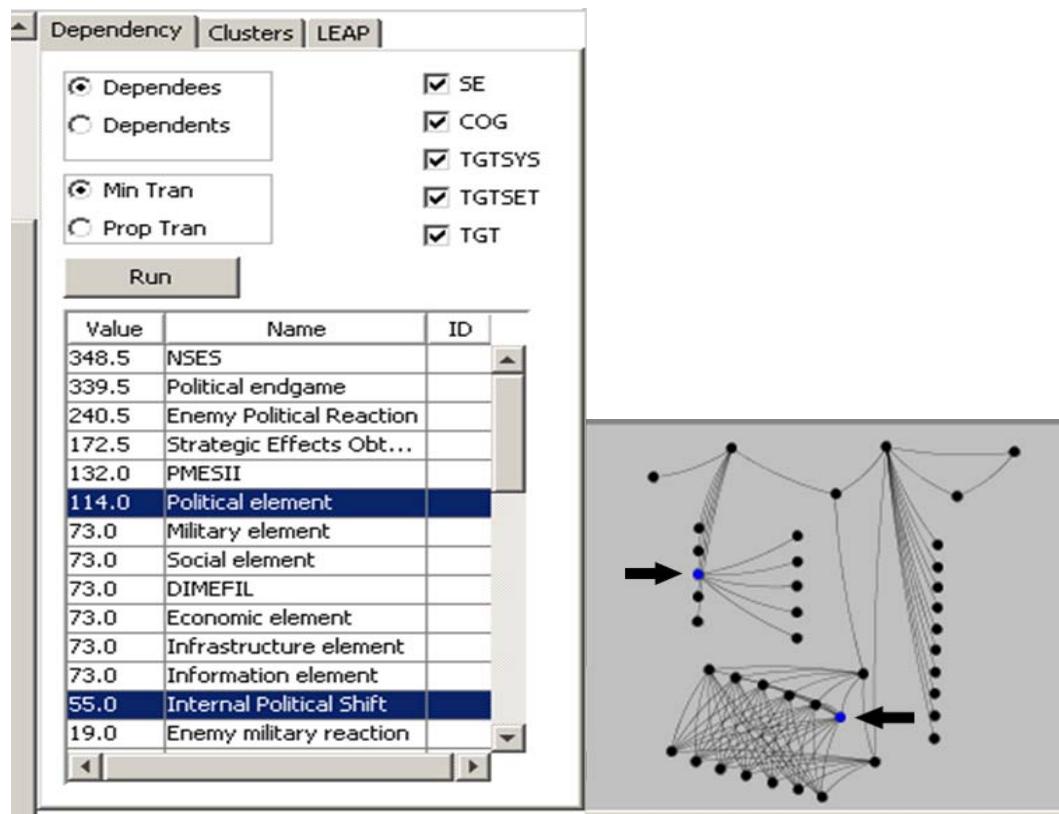
**Figure 8. Political element dependency on MESII elements.**

With the model described, the next step is to run an analysis. This first result should indicate whether this model, as depicted, correctly describes the logic of the combined Lee-DIMEFIL/PMESII theory. For ease of reference, this combined model shown previously in figure 7, incorporating the DIMEFIL-PMESII nexus and the modified Lee theory of victory, will be referred to as the “Strategic Endgames Model.”

The algorithm used for the first analysis is Athena’s “dependency analysis” which itself has two options. The first uses a “minimum transitive” calculation, shown as MinTran in the figures which follow. MinTran calculates the dependency each node has on other nodes, given that their interconnecting links have a specified minimum weight. By adjusting the minimum weight to be used, the planner forces the model to consider or exclude minor dependencies. This can be particularly useful if there are many small,

uncertain dependencies which might obscure the effects of a few large dependencies. A node is given a higher “value” if it has more connections of higher weight.<sup>87</sup>

The algorithm calculates every connection between every node. When calculating the value of any given node, MinTran uses the full weights of other links, regardless of how far they are from the node being calculated. By contrast, the second option deprecates the weight slightly for links more distant from the node currently being calculated. That is, it assumes that dependencies lose some effect as they propagate through the system, hence the name “PropTran.”<sup>88</sup> See the top of figure 9.



**Figure 9. Athena MinTran Analysis of Strategic Endgames Model.**

The results of the first analysis are shown on the left in figure 9. The right side shows the Strategic Endgames Model; the arrows indicate the nodes highlighted in the

<sup>87</sup> Brian Drabble and Tim Black, “Athena Graphical User Interface,” 4

<sup>88</sup> Ibid.

analysis window on the left. Not surprisingly, the nodes at the top of the hierarchy have the most “dependees,” so they have the highest values. Since MinTran does not consider how “far away” a link is, every link in the model increases the value applied to the NSES node. Similar logic applies for the political endgame, enemy political reaction, and strategic effects obtained.

The next two lines are more interesting. Since PMESII changes depend on DIMEFIL activities, and there are many interconnecting links, it makes sense that the “gathering PMESII node” ranks high. More importantly, since the Strategic Endgames Model stated that the Political element is crucial, it is gratifying to see it ranked first among the PMESII elements (value = 114). The other MESII elements all have the same number of interconnections in this generic model, so naturally hold the same weight (value = 73).<sup>89</sup>

The results also highlight a possible problem with this approach. If all links across a large model are considered equally, a planner could artificially create an important node by spending more time detailing that one. That is, if the planner believes that economics are important to the campaign’s success, and spends extra time filling in the details of that system, then the “E” element of PMESII will have many more nodes and many more interconnections. It will then artificially gain greater weight, because the model does not know “why” E has more elements; just that it does.

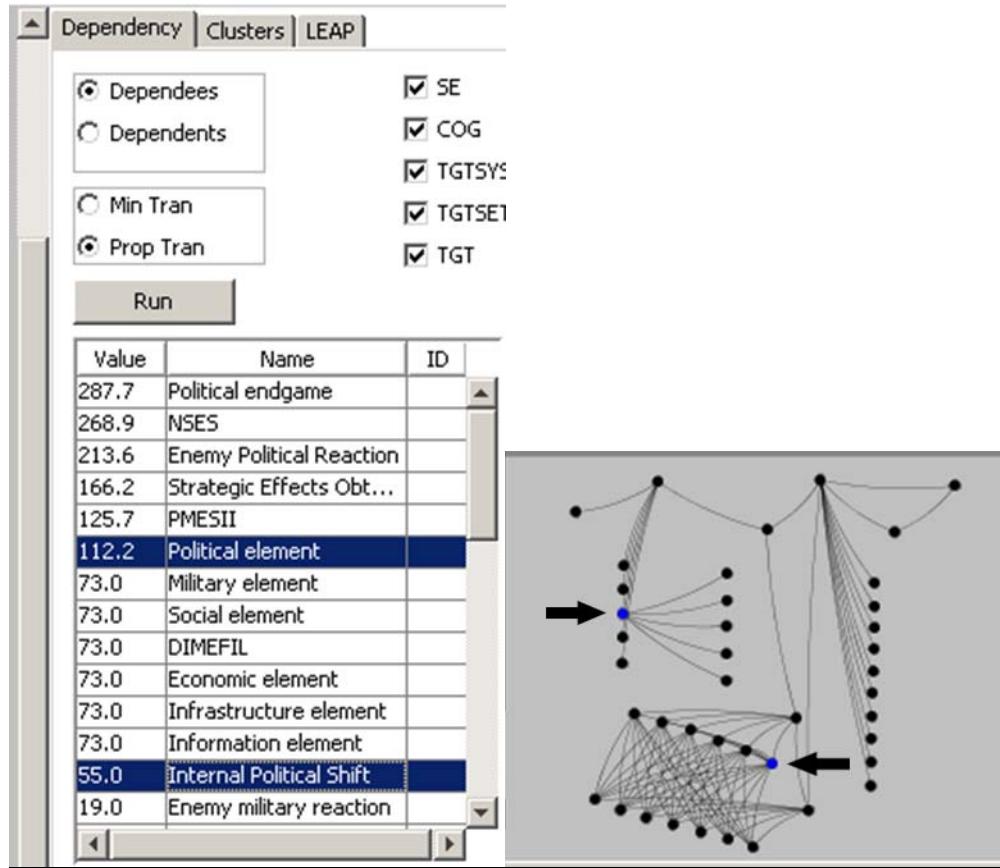
As an example, since the planner entered the various types of internal political shifts, but not the various types of other political endgames, that node jumps higher in value. This is an artifact of the way the planner built the model, but already points to an interesting conclusion. Just as with the Political element, Athena has just told the

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<sup>89</sup> The values are dimensionless; the numbers themselves are relative to other nodes in this model.

planner, “You have stated this node is important.” In fact, that node is only important if the planner is examining internal political shifts, but Athena can only read what it has been told.

The PropTran algorithm was created to solve this problem, so the next step is an analysis with that option. Figure 10 shows the results.



**Figure 10. Athena PropTran Analysis of Strategic Endgames Model.**

Again, the top level elements in the Lee model appear first, but no longer in the same order. The effects of detailing internal political shift under the political endgame have presented themselves. Since the political endgame node is one “jump” closer to the five endgames and five types of internal political shift than the NSES node is, and one “jump” closer to the rest of the model, it is no surprise to find it now listed first, ahead of

NSES. While this does not change any conclusions about the concept, it should serve as a warning to anyone unthinkingly looking for a “right” answer based solely on numbers.

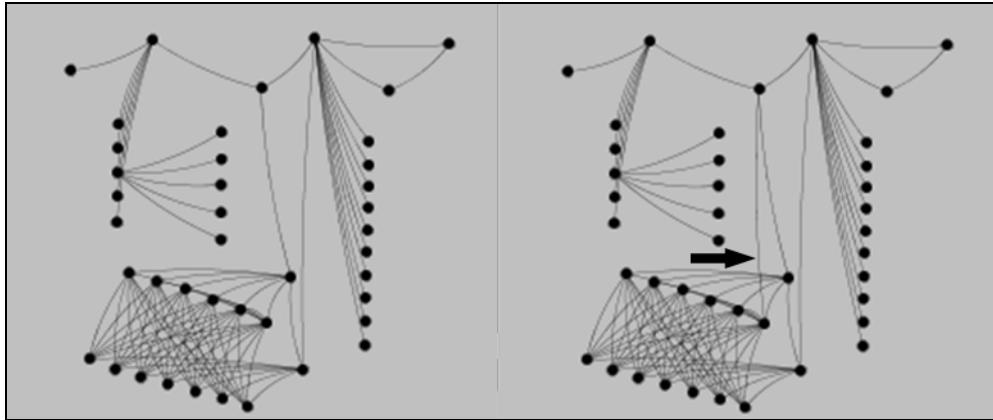
More importantly, however, the Political element has maintained both its position and approximate value. PropTran seems to make the same implication about the Political element’s importance relative to the other MESII elements, consistent with theory.

An obvious counterargument to this assertion is that the reasoning is circular: the Political element is defined as most important, so additional links were added to boost its importance, so the analysis showed it to be most important. If this were a model of an entire plan, that would be a correct counterargument. A planner must not decide, *a priori*, that an activity is critical and then boost its importance by adding additional detail. But the quest here is to see whether the Athena model can accurately represent the combined theory developed in Chapter 3. If a high-level model can be created which gives results consistent with theory, then it is possible to ask whether the model is useful to planning.<sup>90</sup>

Given the importance of the Political element, a reasonable question to ask is whether the enemy political reaction should depend on it directly—in other words, should there be an additional connecting link to the Political element? What effect would this have on the results? This connection is shown in figure 11, in which the entire model is shown, before and after, using Athena’s navigation pane.

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<sup>90</sup> This is non-trivial. No such model previously existed, and the Strategic Endgames Model shown resulted only after numerous false starts, none of which captured the essential reasoning.



**Figure 11. Strategic Endgames Model with and without direct link to Political PMESII element.**

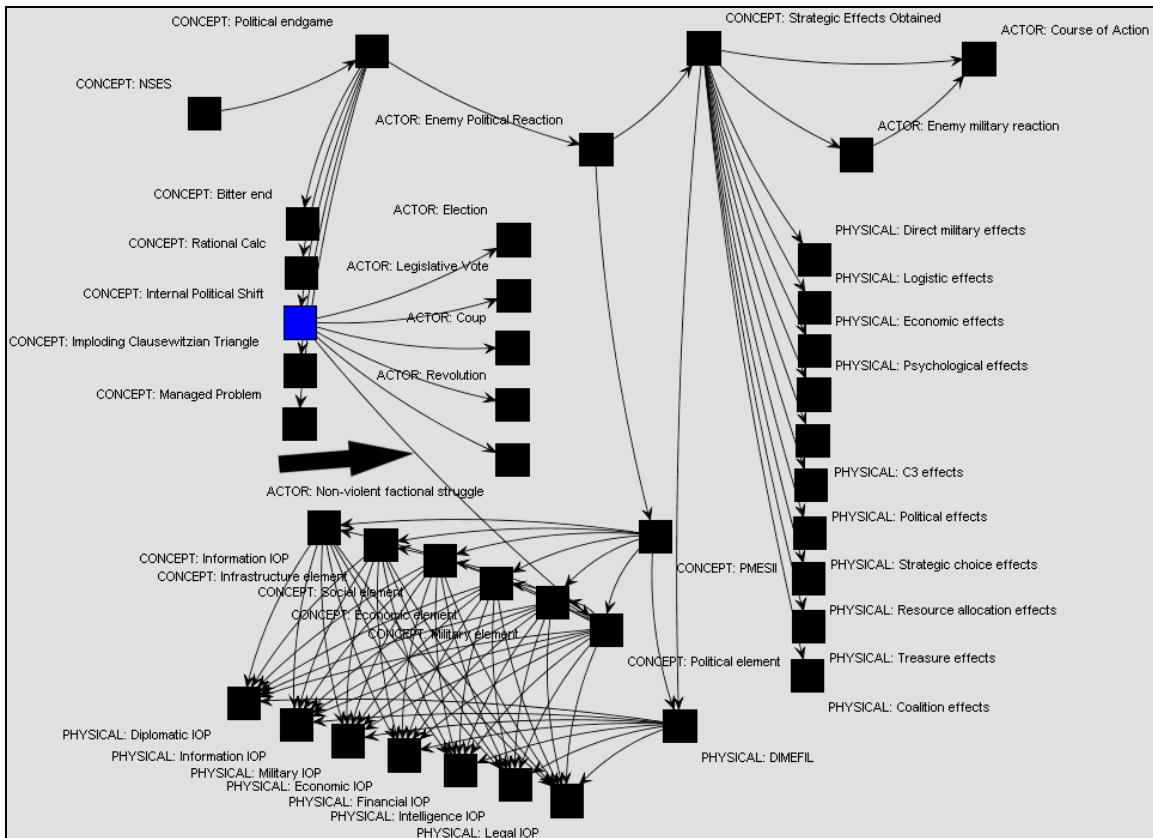
As seen in figure 12, the answer to both questions seems to be the same: It does not matter. The values returned are approximately the same; the order of elements is unchanged. The concept developed in Chapter 3, now entered into the Athena tool, seems to be relatively robust.

Value	Name	ID	Value	Name	ID
287.7	Political endgame		295.4	Political endgame	
268.9	NSES		275.9	NSES	
213.6	Enemy Political Reaction		222.1	Enemy Political Reaction	
166.2	Strategic Effects Obt...		166.2	Strategic Effects Obt...	
125.7	PMESII		125.7	PMESII	
112.2	Political element		112.2	Political element	
73.0	Military element		73.0	Military element	
73.0	Social element		73.0	Social element	
73.0	DIMEFIL		73.0	DIMEFIL	
73.0	Economic element		73.0	Economic element	
73.0	Infrastructure element		73.0	Infrastructure element	
73.0	Information element		73.0	Information element	
55.0	Internal Political Shift		55.0	Internal Political Shift	
19.0	Enemy military reaction		19.0	Enemy military reaction	

**Figure 12. Athena PropTran Results for Fig. 11—effects of link to Political element. No change to order; minimal change to values with or without direct dependency link.**

With indications that the Athena model accurately reflects the concepts contained in the Lee-DIMEFIL/PMESII Strategic Endgames Model, the next question is what Athena can tell the planner about a preferred political endgame.

The planner identifies a desired political endgame by simply drawing a link between that endgame and the node representing PMESII. Within the model, that link makes the statement that obtaining *this* endgame depends on the reaction within PMESII. The model then no longer shows a generic political reaction, but instead one leading to the desired (or expected) endgame. Figure 13 shows the model with the endgame internal political shift selected, and Figure 14 shows the results of the analysis.



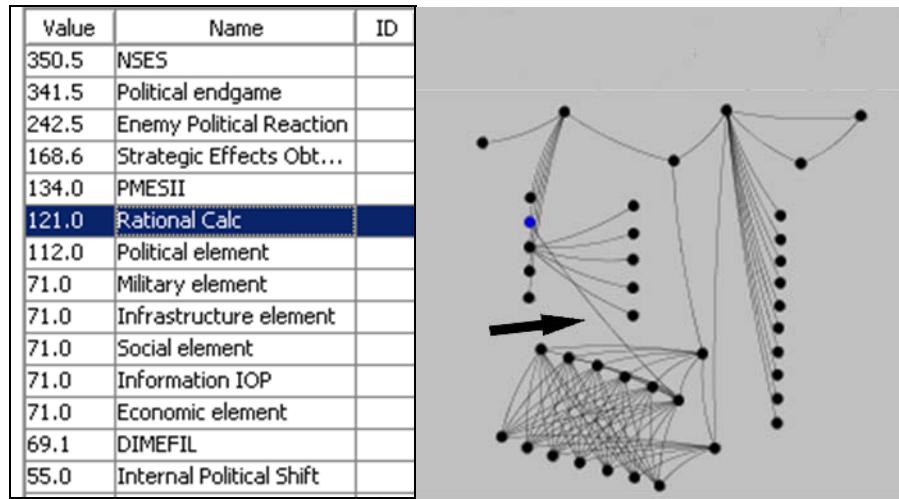
**Figure 13. Internal Political Shift Endgame.**

Value	Name	ID	Value	Name	ID
350.5	NSES		295.4	Political endgame	
341.5	Political endgame		275.9	NSES	
242.5	Enemy Political Reaction		213.6	Enemy Political Reaction	
168.6	Strategic Effects Obt...		166.2	Strategic Effects Obt...	
166.0	Internal Political Shift		156.0	Internal Political Shift	
134.0	PMESII		125.7	PMESII	
112.0	Political element		112.2	Political element	
71.0	Military element		73.0	Infrastructure element	
71.0	Infrastructure element		73.0	Social element	
71.0	Social element		73.0	Information element	
71.0	Information IOP		73.0	Military element	
71.0	Economic element		73.0	Economic element	
69.1	DIMEFIL		73.0	DIMEFIL	
19.0	Enemy military reaction		19.0	Enemy military reaction	

**Figure 14. Internal Political Shift Endgame: MinTran and PropTran Results.**

The most obvious difference is that the value of the internal political shift node (highlighted) has jumped near the top of the list for both algorithms. The values of NSES and political endgame nodes have also increased. The reason for the change to the latter two values is that there are now more total paths between the nodes in the model.

The internal political shift value has jumped for a different, more substantive reason. Before, its ranking was artificially inflated as the only endgame with specified subtypes. Now, its extremely high rating also reflects that the planner has stated this is the endgame of interest. To verify this assertion, the planner can select a different endgame, rational calculation, and rerun the analysis. The results, shown in figure 15, confirm the assertion: now, rational calculation has moved up. It does not reach the same value as internal political shift, because it does not have five extra nodes attached to it—but it could, if the planner had some idea about various ways the enemy leader’s calculation might occur.

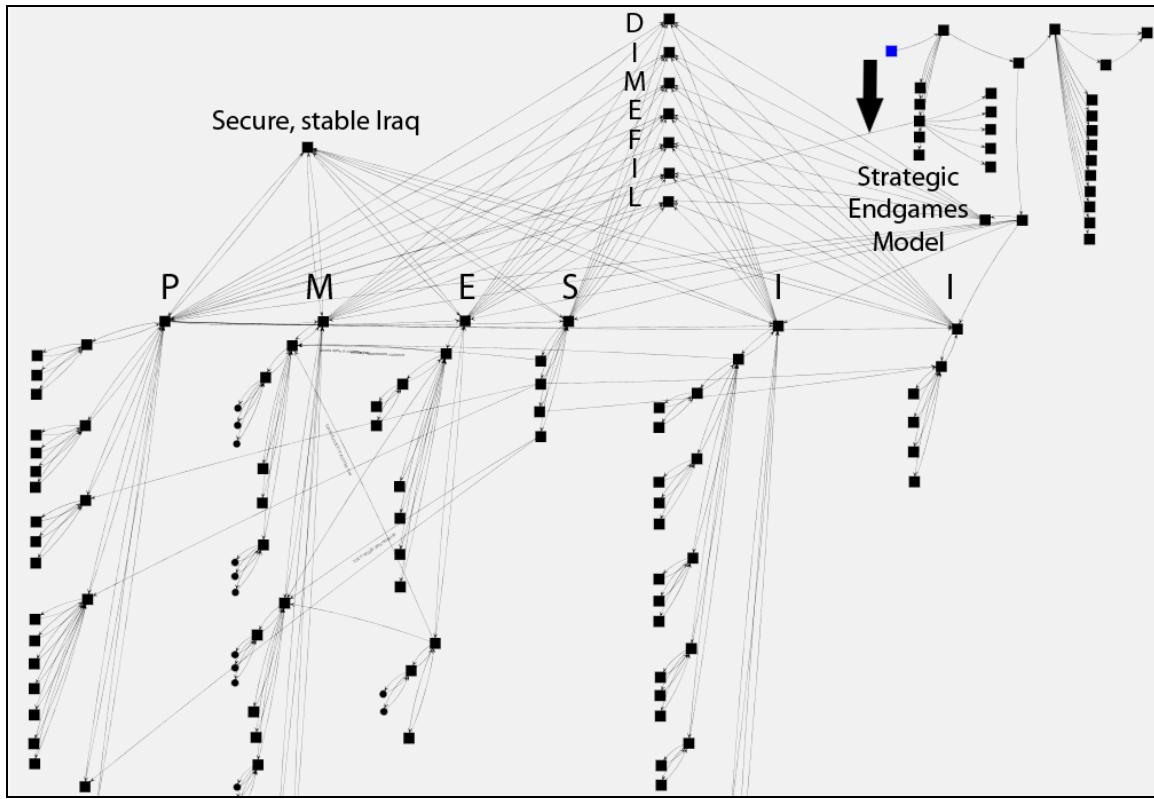


**Figure 15. Rational Calculation Endgame: MinTran Results.**

The Strategic Endgames Model thus functions as expected. It is able to tell the planner which items appear to be most important, based on the assertions the planner has made.

The next step is to determine whether the model can say something useful about a real-world plan. Figure 16 shows an Athena model built to represent the desired NSES of “a secure, stable Iraq.” The nodes contained in this plan are listed in Appendix B, and equate to end-state conditions, or effects statements, for a plan. This scenario represents a difficult problem with many interconnections, not all of which may be fully understood by the planning team or leadership.

Figure 16 arrays the PMESII elements horizontally across the middle, extending from the NSES. The DIMEFIL activities are represented by the vertical stack at the top middle, interconnected in the web first seen in Chapter 2. Beneath the PMESII elements are the various subcomponents of each, as listed in Appendix B (each individual square in the figure represents a node).



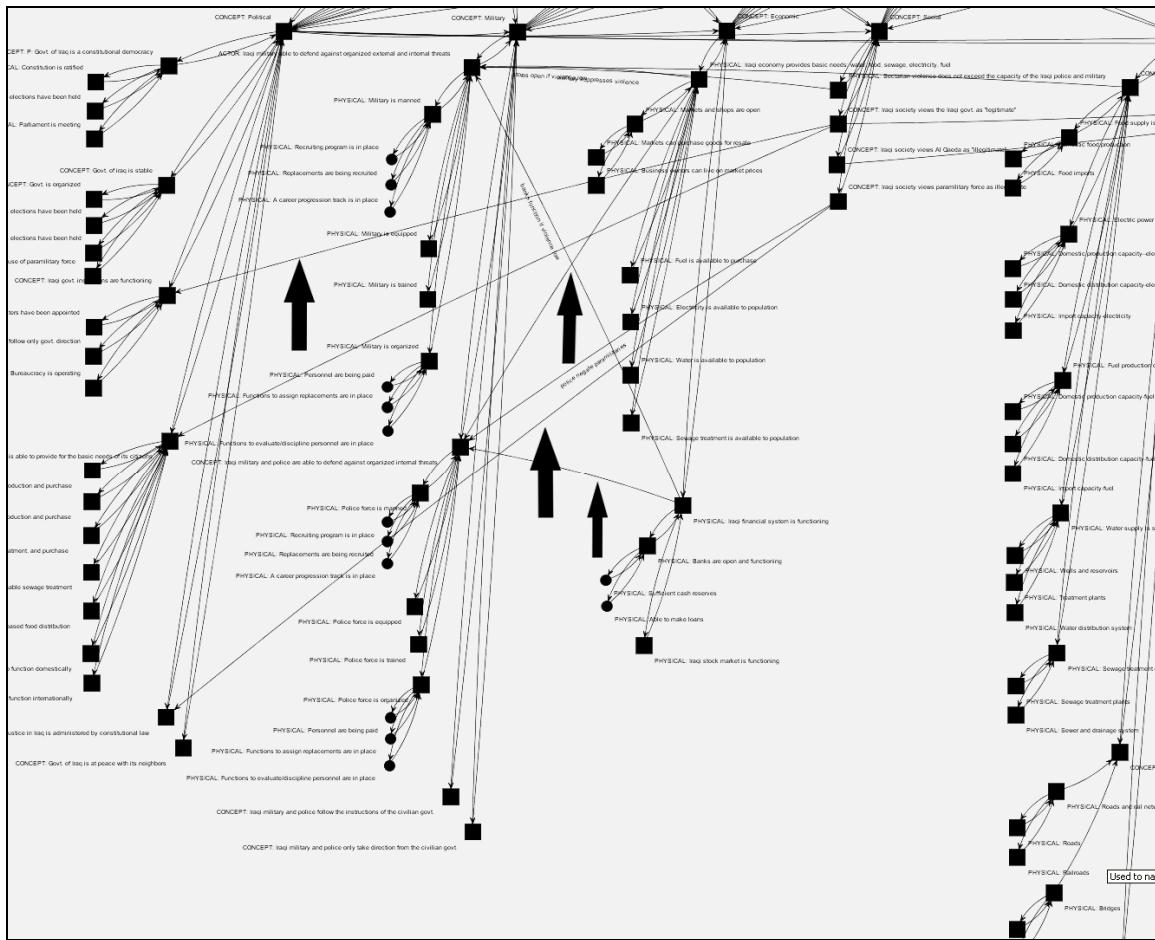
**Figure 16. Iraq NSES detailed model attached to Strategic Endgames Model; Internal Political Shift Endgame selected.**

The core Lee model is shown in the upper right, connected to the DIMEFIL/PMESII web as before, and together comprising the Strategic Endgames Model. The planner has selected internal political shift as the political endgame of interest, and has connected it to the Political element of PMESII, as indicated by the arrow.

Across the model, most dependencies are bi-directional. That is, the planner assumes that if A affects B, then B probably also affects A. There are some exceptions, when the relationship is better understood. For example, sufficient water supply depends on wells and reservoirs, but wells and reservoirs do not depend on there being a sufficient water supply. Similarly, the workings of a government may be highly interconnected, but certain things are not. Iraq would be a constitutional democracy if it had a ratified

constitution, but ratifying the constitution does not depend on the government first being a constitutional democracy. In this way, the planner eliminates links that may artificially inflate certain aspects of PMESII. It follows that much of this process may be trial-and-error.

The planner has also established dependencies between particular components of the PMESII system, shown in figure 17 by arrows. Here, the logic is recorded.



**Figure 17. Dependencies within Iraq PMESII model.**

Describing just a few interconnections for illustration (see Appendix B for the complete node list), the planner believes that the Iraqi people will see their government as legitimate, regardless of its form, if its ministries are functioning and it is able to provide

for the basic needs of its citizens. Similarly, the planner believes the Iraqis will view paramilitary force (e.g. so-called militias) as illegitimate if the Iraqi judicial system is functioning. The Iraqi economy will be able to function if the military and police are able to provide sufficient security, but the economy is also dependent on sufficiently capable infrastructure to provide and distribute food and other goods to sell. Each statement is recorded by connecting a dependency link between the nodes in question. The logic behind any link can be made more explicit with a label.

Obviously, many more interconnections are probably required. Nevertheless, before spending time building an exquisitely detailed model, an analysis at this early stage is useful, to see what the model may reveal. Partial results are shown in figure 18.

Value	Name	Value	Name
722.3	Political endgame	591.4	Military
678.0	Enemy Political Reaction	585.0	Information
660.1	NSES	584.9	Govt. or Iraq is able to provide
644.2	PMESII	583.1	Iraqi govt. institutions are func
640.1	Political	580.9	Iraqi economy provides basic n
631.0	Internal Political Shift	580.5	Govt. of Iraq is at peace with it
627.2	Iraqi utility infrastructure is able	577.9	Justice in Iraq is administered b
627.1	Secure, stable Iraq	577.5	Iraqi society views paramilitary
616.5	Infrastructure	577.2	Iraqi transportation infrastructu
596.5	Govt. of Iraq is stable	571.5	Water supply is sufficient to me
596.4	Social	570.7	Electric power production capaci
594.9	Economic	570.7	Fuel production capacity is suff
592.5	P: Govt. of Iraq is a constitutio	569.8	Food supply is sufficient to mee
591.4	Military	566.3	Financial infrastructure function

**Figure 18. Iraq NSES PropTran results: first 28 nodes, Internal Political Shift endgame specified.**

Not surprisingly, the high-level elements of the Lee model and the DIMEFIL/PMESII elements are prominent, due to their interconnectedness. Also as expected, the internal political shift endgame ranks high, as does the top node in the Iraq NSES plan, “Secure, stable Iraq.” Nothing of particular interest is shown by those nodes, other than that they appear where expected.

The planner is looking for new elements from the plan just attached to the Strategic Endgames Model. The Iraqi utility infrastructure (as opposed to the transportation or banking infrastructure) tops that list, along with the need for the government to be stable, organized, and functioning. It is important to remember that the planner entered the phrase, “The government of Iraq is a constitutional democracy” (value 592.5) because he believes it to be true, and believes certain other things flow from that. Given the same interconnections, Athena would give the exact same value for the phrase, “Node 144.” Nevertheless, the planner entered that information with the expectation that it reflects the real world, and that expectation leads to the overall model.

What is clear is that items with multiple cross-dependencies are shown to be important. The planner identifies such items, and if the planner says something is important, it shows up in the results.

Not yet included in this early analytic run is any connection that a functioning modern economy depends on functioning government institutions. Utilities, at least, likely require supporting regulations or licenses. Regulations might allow them to obtain land to construct power lines or build water lines through public easements. Licenses may permit utilities to discharge treated wastewater, etc. Such a relationship is likely to be culturally dependent, as some societies will be more or less inclined to wait for permission to proceed. Significantly, the planning for post-hostilities in Iraqi Freedom assumed that the government ministries would remain functioning and that the infrastructure was sufficient.<sup>91</sup> After de-Baathification, when coalition forces determined

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<sup>91</sup> Donald P. Wright and Timothy R. Reese, *On Point II: Transition to the New Campaign* (Fort Leavenworth: Combined Studies Institute Press, 2008), 79.

the infrastructure was actually dilapidated, Iraqi society largely waited for government instructions to rebuild—instructions that were not forthcoming.<sup>92</sup>

Adding those links naturally makes the economic and associated government functions more important, i.e. gives them a higher calculated value. However, with a model this size, changes are small, as seen in figure 19.

Value	Name	ID
620.0	Secure, stable Iraq	NS...
610.1	Infrastructure	
599.6	Iraqi economy provid...	
590.0	Social	
589.5	Govt. of iraq is stable	
588.4	Economic	
585.5	P: Govt. of Iraq is a c...	
585.0	Military	Mil
583.5	Iraqi govt. institution...	
578.6	Information	
577.8	Govt. or Iraq is able t...	
573.5	Govt. of Iraq is at pe...	
571.5	Iraqi transportation in...	
571.1	Iraqi society views pa...	

**Figure 19. Iraq NSES PropTran results: Economy to Government dependency links added.**

The results indicate that the concept is relatively immune to lower-level errors in the structure. Although such a model could obviously be modified and refined extensively, the observation that changes are small suggests that doing so may not be necessary in order to evaluate Athena's ability to support the thesis.

It seems clear that the model is capable of identifying areas, activities, or results that may be particularly important. Building a rough model is not difficult, if the planner has a structure in mind. It took longer to conceptualize and build the Lee-DIMEFIL/PMESII model than it did to conceptualize and build the Iraq NSES model, even though the latter is an order of magnitude larger. The operative term is “rough,”

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<sup>92</sup> Ibid, 403.

however, since a team could spend days refining the Iraq-NSES model. The primary logic is contained in the cross connections. As the cross-connections are added, a planning team must decide the importance of the new link, and whether that should decrease the importance of the generic links. Since there are many generic links, this is not a trivial concern

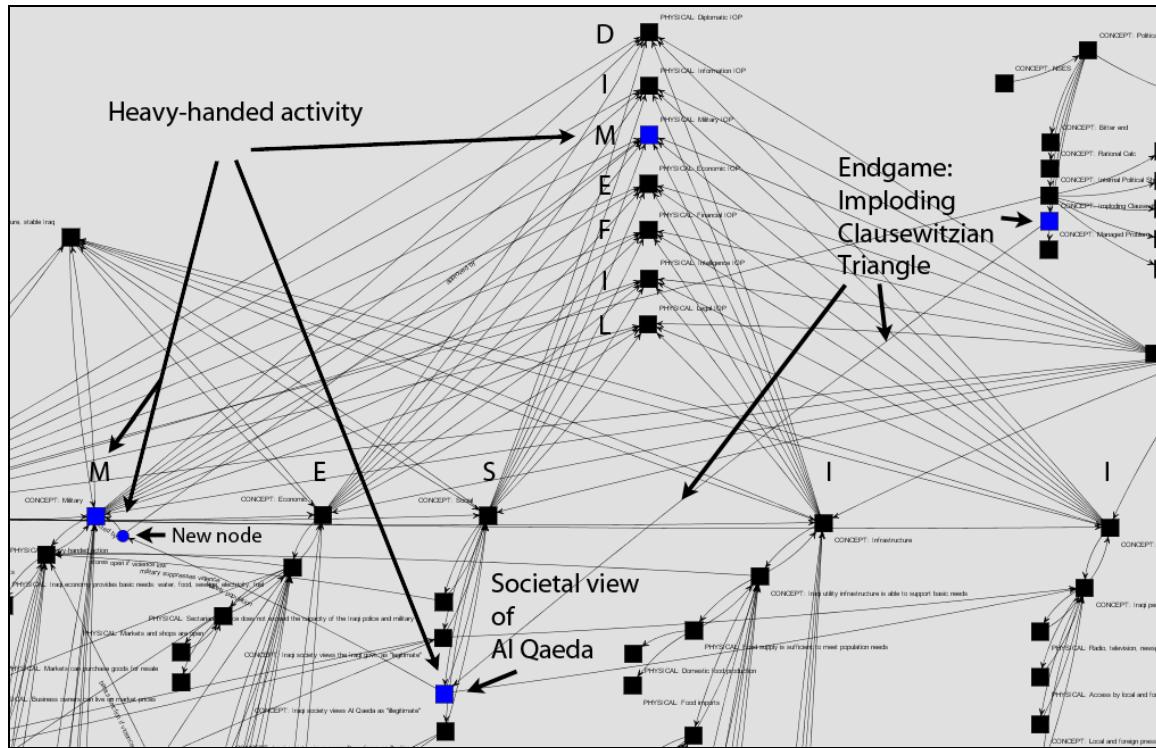
The larger question remaining is whether the model can reflect an impact on the likely political endgame. The second part of the thesis is not merely to record DIMEFIL/PMESII, but to do so in a way that suggests whether the plan is moving towards the desired political endgame or towards a different endgame.

To see the effects of particular actions on particular outcomes, the actions must obviously be specified. The current model only shows generic DIMEFIL-on-PMESII activity, although the PMESII interactions are reasonably detailed. Applying specific DIMEFIL actions requires two steps. First, the planner creates nodes to represent those actions. Second, the planner adds the links indicating what he believes those actions will lead to.

In figure 20, the planner has indicated a concern that heavy-handed military activity may be counterproductive. A physical node, “heavy handed activity” is added, which is dependent on the PMESII military element for its conduct and the DIMEFIL military instrument for support. Here, the planner’s logic assumes the Iraqi military acts and the coalition military approves of the action, but he could indicate the reverse by changing the labels. The social concept that, “The Iraqi people view Al Qaeda as legitimate” is supported by (i.e. depends on) heavy handed action.<sup>93</sup>

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<sup>93</sup> As originally phrased, the concept was “The Iraqi people view Al Qaeda as illegitimate,” but the change only requires changing the label of the node. This is true generally, although connecting links may require



**Figure 20. Specific Action Leading to Undesired Endgame.**

The planner believes that the resulting support for Al Qaeda may result in an imploding Clausewitzian triangle, and therefore makes a dependency link between the two. Will that endgame result? There is no way to predict, but the planner believes it to be true. He has not yet indicated what strategic effect may intermediate between the two nodes. In figure 21, the PropTran analysis shows that the “imploding Clausewitzian triangle” endgame now has a much higher value—500, instead of its original 10. This should not be surprising, since the result merely shows that that node now has many more connections. The model indicates what the planner believes.

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their verbs to be changed from “supports” to “contradicts.” That latter step does not change the dependency calculation, but if omitted, the model will not accurately reflect the planner’s thinking.

Value	Name	ID
521.0	Ministers have been a...	
521.0	Bureaucracy is operat...	
521.0	Govt. officials follow ...	
518.8	Banks are open and f...	
505.4	Domestic distribution ...	
505.4	Domestic production c...	
500.7	Imploding Clausewitz...	
480.3	Markets can purchase...	
480.3	Business owners can l...	
477.6	Local and foreign pre...	
477.6	Local and foreign pre...	
475.8	Radio, television, ne...	
475.8	Access by local and f...	
468.8	Able to make loans	

**Figure 21. Result of DIMEFIL M Action on Political Endgame.**

Now, however, suppose a planner believes that a firm military hand is necessary to demonstrate the government's resolve. There were some suggestions to this effect following the murder of four contractors in Fallujah in 2004.<sup>94</sup> Using "heavy handed" as a synonym for "firm," the planner indicates this logic by connecting it to the Social node, "The population views the Iraqi government as legitimate." The planner next indicates that the expected endgame from this activity is a non-violent factional struggle. This is a form of internal political shift, but the planner makes the logic explicit, since the thought process is that the firm military action will make the factions realize they cannot prevail with violence.<sup>95</sup>

The results are startling, as shown in the left panel of figure 22. The non-violent factional struggle has moved to 510—but the imploding Clausewitzian triangle is only 3 lines away, at 500. The actions are working at cross-purposes. An imploding Clausewitzian triangle is not desired; a non-violent outcome is desired. But, the planner

<sup>94</sup> See, for example, Bill O'Reilly, "Aftermath of Fallujah activities," O'Reilly Factor Flash online summary of *The O'Reilly Factor*, December 17, 2004, <http://www.billoreilly.com/show?action=viewTVShow&showID=58#3> (accessed March 23, 2009).

<sup>95</sup> The planner would also realize that internal political shift is already the specified desired endgame, so adding another link to it will not reveal anything new.

is contemplating action that, by his own logic, should lead towards both. Since there can be only one outcome, the planner has a contradiction in his thought process.

Value	Name	ID
526.3	Regulations enable fi...	
526.3	Regulations enable se...	
524.2	Ministers have been a...	
524.2	Bureaucracy is operat...	
524.2	Govt. officials follow ...	
520.5	Banks are open and f...	
510.3	Non-violent factional ...	
506.5	Domestic distribution ...	
506.5	Domestic production c...	
500.7	Imploding Clausewitzi...	
481.8	Markets can purchase...	
481.8	Business owners can l...	
478.8	Local and foreign pre...	
478.8	Local and foreign pre...	
532.2	Regulations enable el...	
532.2	Regulations enable fi...	
532.2	Regulations enable se...	
531.9	Iraqi people are able ...	
524.2	Banks are open and f...	
522.3	Non-violent factional ...	
509.7	Domestic distribution ...	
509.7	Domestic production c...	
505.4	Imploding Clausewitzi...	
485.1	Markets can purchase...	
485.1	Business owners can l...	
482.4	Local and foreign pre...	
482.4	Local and foreign pre...	
480.6	Radio, television, ne...	

**Figure 22. Actions Working at Cross-Purposes, Leading towards Different Endgames.**

If, instead of using “heavy handed actions” as a synonym for “firm hand,” the planner had created a new “firm hand” node, the overall conclusion does not change. As shown in the right panel of figure 22, although the “values” change slightly, the two endgames are still virtually adjacent. The values themselves are meaningless, of course, and the tool is not suggesting which outcome is more likely—only that mutually exclusive ideas are held by the planning team.

The Athena tool can be used to show where a complex plan has internal inconsistencies.

The remaining issue is to determine whether specifying the intervening strategic effect will change the analytic results. There are two cases: activities work through the same strategic effect, or activities work through multiple strategic effects. The results of the first case are shown on the left of figure 23, with both actions assuming a political

effect. The right panel shows the results assuming, instead, that the heavy-handed action works through a psychological effect and firm action works through a political effect.

Value	Name	ID	Value	Name	ID
415.5	Iraqi military and polic...		482.4	Local and foreign pre...	
414.9	Political effects		480.6	Access by local and f...	
388.8	Iraqi military and polic...		480.6	Radio, television, ne...	
388.8	Iraqi military and polic...		473.6	Able to make loans	
388.2	Police Force is manned		473.6	Sufficient cash reserves	
385.8	Police Force is organized		473.3	Non-violent factional ...	
383.5	Imploding Clausewitzi...		464.9	Imploding Clausewitzi...	
383.5	Non-violent Factional ...		415.5	Iraqi military and polic...	
378.8	Police Force is trained		388.8	Iraqi military and polic...	
378.8	Police force is equipped		388.8	Iraqi military and polic...	
320.7	Strategic Effects Obt...		388.2	Police force is manned	
258.1	Replacements are bei...		385.8	Police force is organized	
258.1	Recruiting program is ...		384.4	Strategic Effects Obt...	
258.1	A career progression ...		378.8	Police force is trained	

**Figure 23. Multiple Actions through Strategic Effects**

Adding the intermediately strategic effects does not detract from the original conclusion. For the first case, there is also a graphically obvious connection on the Strategic Endgames Model itself when two dependency links lead from one effect node to multiple, conflicting political endgame nodes.

This simple example is representative of a campaign design using LLO's. The limitations of the current graphical interface suggest little more is to be gained analytically by building more extensive LLO's, but a representative Phase 1 ("Deter") model is shown at Appendix C.

The difficulty encountered in presenting these results suggests several additional conclusions. Most obviously, from a planning team perspective, the tool would require enhancements to the user interface to make it easier for multiple planners to enter multiple actions. It would also require enhancements to ensure the planner need not wade through hundreds of lines looking for surprises. While non-trivial, several possible

solutions present themselves to these problems. Creating a different window that only shows the endgames and their values would allow a planner to continuously follow the impact of military activities. Triggers could be used to indicate when endgames values are within an arbitrary spread. These are offered only as examples, but without such improvements, it is difficult to determine whether the concept, although supported, is actually operationally suitable and acceptable.

The limited graphical interface also leads to two broader conclusions. First, stylistically, this tool would require a more sophisticated presentation interface for use with senior policymakers. For example, there is no ability to print an entire model, such as for a wall chart. However, anyone desiring to use the tool outside the research environment would be required to license it. Such a contract could include any presentation features desired. Other obvious candidates include depicting the important links with heavier lines, changing the font size for labels, and providing the ability to declutter the presentation. Possible decluttering approaches could include turning off display of various node levels or placing certain elements on selectable display layers (e.g. DIMEFIL activities on one and PMESII elements on another).

Second, substantively, this version of Athena also provides very limited fields for the planner to use in recording reasoning. The dependency link label is the primary location available for such information, and there is no ability to interact with that text except by clicking on the link itself. Again, as a research prototype, that limitation is not unexpected, but the capability is a key requirement of the thesis. Since other tools already in use offer such capabilities, there is no reason to conclude more enhanced “note taking” or comment fields could not be incorporated, particularly since the model is

constructed in eXtensible Markup Language (XML). Similarly, an operationally suitable tool would require capabilities to copy and merge plans, so it is not necessary to redraw every plan. Thus, neither of these conclusions seriously affects Athena's ability assist the planner with the core of the thesis.

A more advanced concept would be to utilize the XML capabilities of Microsoft Word to create parts of a JOPES or Adaptive Plan in XML, and then import them directly into an Athena plan. This is recommended for further research.

Athena already incorporates a version of Princeton University's WordNet, which gives it limited capability to automatically calculate dependency weights, if various attributes of a node are specified. This could potentially be used to tie the higher-level concepts of a published plan to the lower-level data in intelligence databases. Such capability might have to wait for further semantic web developments to fully exploit.

Whether Athena is the "right" tool for this purpose, or even if this is the best approach, one conclusion seems irrefutable: it is possible to record planner's reasoning and indicate logical inconsistencies using software. The advantage of such an approach is it lets planners think and machines assist. Arguably, that advantage goes farther—it *requires* planners to think, and to confront their own beliefs about their plan.

## CHAPTER 5

### THE REAL WORLD IN HINDSIGHT—CASE STUDIES

The test of any model's practical value is not whether it looks academically pleasing, briefs well, or even whether (or not) it has arrived in doctrine. Rather, the test is whether it can be quickly and usefully employed. The most theoretically complete model is of little use to a policymaker or warfighter if it is too hard to use.

It is worthwhile, then, to test the modified Lee model against real world examples, to see whether, at least in hindsight, it can construct a theory of victory for that scenario. No argument will be made that these conclusions were necessarily the ones derived at the time, nor that they are the only possibilities—only that the logic can be reasonably followed and reasonably argued. In this process, the caution from Chapter 2 must be recalled: this is after-the-fact analysis, so a reasonable chain of events may be much clearer than it was at the time.

There are several planning problems this framework attempts to solve, but three case studies should illustrate whether the model can be usefully applied to the real world: Desert Storm war termination, Allied Force planning, and Iraqi Freedom.

The goals of Operation Desert Storm outlined in operations order 91-001 were to “Attack Iraqi political-military leadership and command-and-control; gain and maintain air superiority; sever Iraqi supply lines; destroy chemical, biological, and nuclear capability; destroy Republican Guard forces in the Kuwait Theater; liberate Kuwait.”<sup>96</sup> Effectively, Desert Storm was a classic Clausewitzian problem—the value of Kuwait versus the cost to obtain (for the coalition) or keep it (for Saddam). Since there was no

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<sup>96</sup> Atkinson, *Crusade*, 21

plan for regime change as part of the operation (unless Saddam had the misfortune to be at a command and control target), that places Desert Storm squarely in the province of rational calculation for both sides. The coalition arrayed against Saddam first threatened, and then proceeded to ratchet up the cost of his keeping the object. This logic partially explains why he never chose to leave. Saddam did not accede until the Iraqi military was forcibly ejected from Kuwait. At that point, the value of Kuwait dropped precipitously. Although the air campaign drove up Saddam's costs, the object's value did not go down substantially until he no longer held it.

A problem with the post-Desert Storm expressed desire for a military coup or Shia uprising was that the United States expressed a desire for an internal political shift. However, that would make the cost infinite for Saddam, since for him personally it would be bitter end. It seems unsurprising, then, that he instead forced the Shia to change their endgame from revolution to rational calculation by threatening bitter end—that is, stop fighting or be exterminated.<sup>97</sup>

With rational calculation endgames on both sides, Desert Storm was an example of operational success leading to questions of what to do next. By contrast, Operation Allied Force seems to be an example of neither side clearly understanding what political endgame was desired, making it a more interesting application of the Lee model.

Planning for Allied Force clearly violated the lessons learned from Vietnam, and codified in air doctrine, that slow escalation simply gives an enemy time to psychologically adjust and prepare for the next escalation.<sup>98</sup> Although it appeared obvious to airmen that the plan would likely fail initially, the military was unable to

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<sup>97</sup> Gordon, *Cobra II*, 11-12.

<sup>98</sup> Paul C. Strickland, "USAF Aerospace Power Doctrine: Decisive or Coercive? – NATO's war over Kosovo, Yugoslavia: the role of air power," *Aerospace Power Journal*, (Fall 2000), 4.

articulate to interagency (particularly the State Department) and NATO why the plan would not work.<sup>99</sup> Neither military nor political leadership had a coherent concept of “how” military actions would lead to victory.

The objective of Allied Force was to get Serbian President Slobodan Milosevic to stop the ethnic cleansing in Kosovo.<sup>100</sup> Airpower in 1999 could not destroy widely dispersed Serbian forces in Kosovo, and those were the forces conducting the ethnic cleansing. They could only be stopped by Milosevic’s order. Although the Kosovo Liberation Army presented a minor ground-based threat, no one at the time seriously believed the NATO would put large ground forces into play—which was precisely why the operation became an air campaign, and why a theory of victory was thus essential.

The objective implies two possible political endgames from a NATO perspective. Milosevic could make a rational calculation based on the value of the object and its cost. Alternatively, NATO could impose a non-violent factional struggle (i.e. internal political shift) by affecting “who has influence in the regime?”

Either endgame could be driven by political and/or psychological effects. The important consideration is that neither can realistically be driven by direct military effects—hence Lt. Gen. Short’s conclusion that the Serbian forces were not the appropriate target for attack, even if he had had the ability to do so.<sup>101</sup> Instead, the coalition attacked Milosevic’s political supporters.<sup>102</sup>

By contrast, Milosevic’s desired endgame for the alliance would be a rational calculation, primarily obtained through coalition effects. Alternately, since NATO

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<sup>99</sup> Ibid, 5.

<sup>100</sup> Ibid, 3.

<sup>101</sup> Ibid, 5.

<sup>102</sup> Eric Schmitt and Steven Lee Meyers, “NATO Targets Rich, Powerful Friends of Milosevic,” Seattle Post Intelligencer (19 April 1999).

functions by consensus, upsetting that consensus would be the equivalent of a legislative vote—an internal political shift.

NATO held; Milosevic conceded. Although Milosevic eventually found himself in United Nations' custody, the interval before that occurred suggests it is unlikely he saw that concession would lead to his end.

In Operation Iraqi Freedom, the stated objectives included regime change, thus making it an unlimited end for Saddam—or a bitter end in terms of Lee endgames. Given that endgame, the implication for US forces was the need to kill or capture Saddam as quickly as possible, since he would likely pay any price to avoid it. With Saddam gone, the remainder of his government would then be faced with a rational calculation if the cost was low enough. If the cost was perceived as too high, then the coalition would need to drive an internal political shift. It would need to pick and support some faction. It would also need to avoid an imploding Clausewitzian triangle at all costs. The managed problem, of course, was the status quo, deemed unacceptable.

A political endgame shift may also imply a strategic center of gravity (COG) shift, especially if the enemy leader is killed or captured to avoid a bitter end. Such a shift might also indicate a transition between phases in a campaign plan.

Using the Strange COG model, if Saddam was the strategic COG because he could wield effective blows (i.e. he had the critical capability to tell the Iraqi army to fight), then killing him implies the undesired bitter end may be foreclosed, and the Iraqi army may no longer resist. But, since the situation was still unresolved, there were still other endgames possible. Thus, the coalition would need to look for a new COG that *can agree to an endgame*. Then, the coalition goal becomes getting that new COG (e.g. the

surviving government, the military leadership etc.) to agree to the new endgame, perhaps through a different set of DIMEFIL/PMESII actions. Only the losing side can determine when the war ends.

## CONCLUSION

The problem at the outset was defining a theory of victory, usable by policymakers at the highest level, which can describe how war, “socially sanctioned violence to achieve a political purpose,” actually leads to an adversary bending to friendly will.<sup>103</sup> This was described as the political endgame. Ultimately, each side in a conflict has a desired political endgame for its adversary; the challenge is getting the adversary to accept the inevitability of that end. “To secure that object we must render the enemy powerless; and that, in theory, is the true aim of warfare.”<sup>104</sup> Yet, the reality is that the enemy is rarely powerless even in defeat, and by its power to capitulate, ultimately has the deciding vote on whether conflict continues.

The second problem was providing strategists—planners—a framework to tie their planning efforts to the desired political endgame. Any number of planning constructs may be used, but the difficulty lies in determining whether the myriad of actions are actually leading towards the desired endgame, inadvertently leading away from it, or, hidden to the planner, are working at cross-purposes. Using DIMEFIL/PMESII, the link from action to endgame was found to be the Political element of PMESII—because all actions and all other elements ultimately drive the political reaction of the adversary. This reaction directly drives the political endgame that results.

The third problem was discovering a way to reveal the inner logic of the plan, making it visible to planners and policymaker alike. By illuminating the logic of DIMEFIL actions, all concerned could see, advocate, or challenge the underlying

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<sup>103</sup> U.S. Joint Chiefs of Staff, *Joint Publication 1: Doctrine for the Armed Forces of the United States* (Washington DC: Government Printing Office), 14 May 2007, I-1.

<sup>104</sup> Clausewitz, *On War*, 85.

reasoning. By tracking the reasoning that planners themselves identify, planners are freed—even forced—to think about the ultimate consequences of their proposed actions.

This thesis has determined that it is possible to construct a usable theory of victory and tie it to a framework that planners understand. It is also possible to track the internal logic of a plan, and to identify inconsistencies. It is even possible to use software to highlight that logic; especially when the logic is internally inconsistent. Whether software can also provide a practical solution is, as yet, undetermined, but it is clearly unnecessary to demand exquisite knowledge of the adversary. Nor is extreme detail from intelligence required in order to conduct useful analysis.

Such analysis will never be deterministic. War is a human endeavor; its nature rarely, if ever, changes. Yet, prediction is an inescapable part of the warfighter’s art. By definition, half of the generals who ever fought a battle were either wrong, gamblers, or fools. If planning rigor can shift the odds even a fraction in our favor, and planners can avoid the temptation of convenient answers, then mental models may offer them a glimpse of the world that their policymaker desires. That view, however unfamiliar, is the ultimate tie between their actions and the ultimate purpose of the war.

“The political object is the goal, war is the means of reaching it, and the means can never be considered in isolation from their purpose.”<sup>105</sup>

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<sup>105</sup> Clausewitz, *On War*, 87.

## APPENDIX A: STRATEGIC ENDGAMES MODEL

The full Lee-DIMEFIL-PMESII model, shown as Figure 7 in Chapter 4, is reproduced in larger format here for reference.

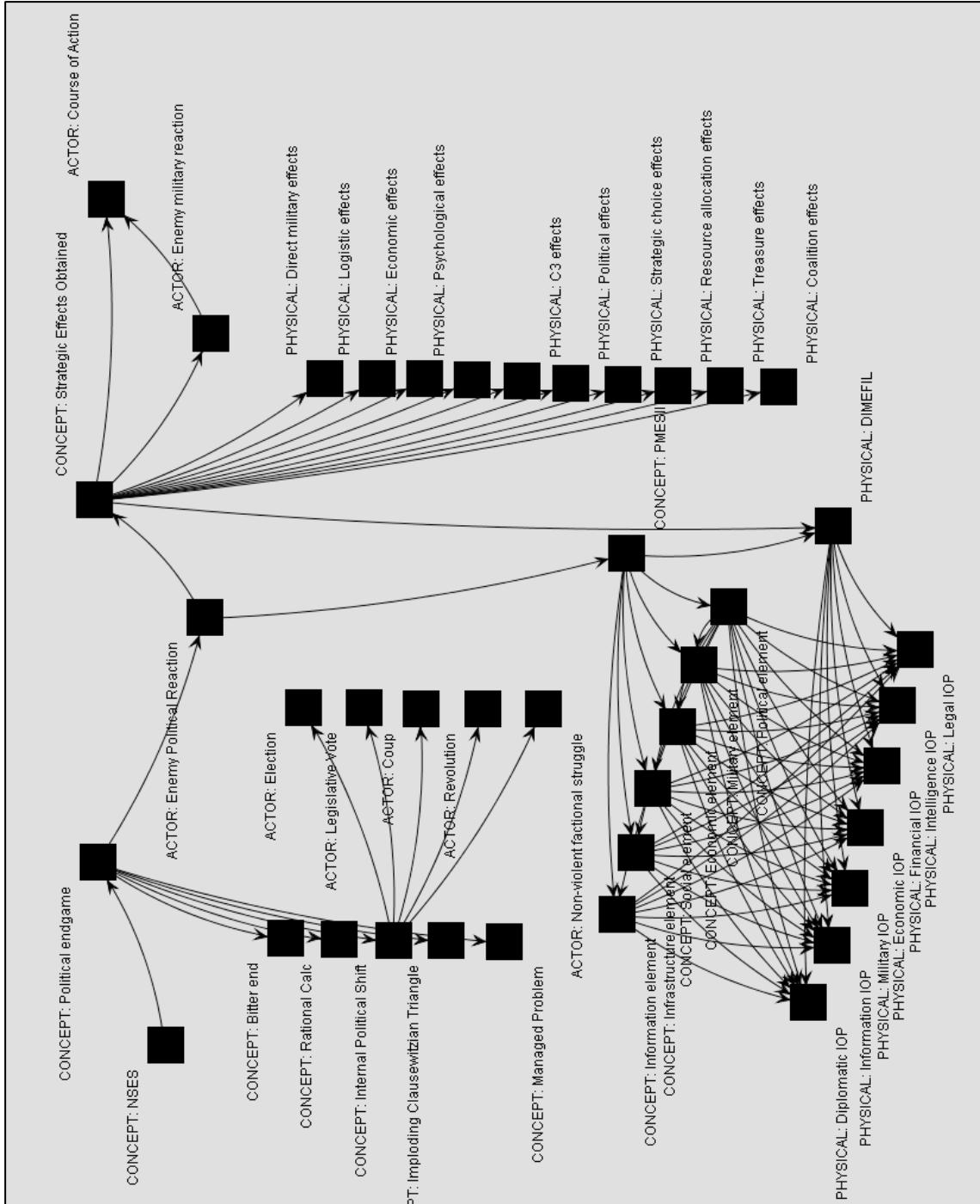


Figure 24. Appendix A: Strategic Endgames Model (modified Lee-DIMEFIL-PMESII model).

## APPENDIX B: IRAQ PMESII MODEL

*Note:* this model is entirely unclassified, and was created without reference to any actual military plans. It is intended to represent a planner's concept for decomposing a desired National Strategic Endstate across PMESII elements.

P— The government of Iraq is a constitutional democracy.

- Constitution is ratified.
- Parliamentary elections have been held.
- Parliament is meeting.

The government of Iraq is stable.

- Government is organized.
- Local government elections have been held.
- Provincial government elections have been held.
- Elected politicians do not advocate the use of paramilitary force.

Iraqi government institutions are functioning.

- Ministers have been appointed.
- Government officials follow only government direction.
- Bureaucracy is operating.

Justice in Iraq is administered by constitutional law.

The government of Iraq is able to provide for the basic needs of its citizens.

- Regulations enable electrical production and purchase.
- Regulations enable fuel production and purchase.
- Regulations enable water production, treatment, and purchase.
- Regulations enable sewage treatment.
- Regulations enable market-based food distribution.
- Regulations enable financial institutions to function domestically.
- Regulations enable financial institutions to function internationally.

The government of Iraq is at peace with its neighbors.

M— The Iraqi military is able to defend the nation state against organized external threats.

- Military is manned.
  - Recruiting program is in place.
  - Replacements are being recruited.
  - A career progression track is in place.

-- Military is equipped.

-- Military is trained.

-- Military is organized.

- Personnel are being paid.
- Functions to assign replacements are in place.
- Functions to evaluate/discipline personnel are in place.

The Iraqi military and police are able to defend the nation state against organized internal threats.

- Police force is manned.

- Recruiting program is in place.
- Replacements are being recruited.
- A career progression track is in place.
- Police force is equipped.
- Police force is trained.
- Police force is organized.
  - Personnel are being paid.
  - Functions to assign replacements are in place.
  - Functions to evaluate/discipline personnel are in place.

The Iraqi military and police follow the instructions of the civilian government.  
The Iraqi military and police only take direction from the civilian government.

E— The Iraqi economy provides basic needs: water, food, sewage, electricity, fuel.

- Markets and shops are open.
  - Markets can purchase goods for resale.
  - Business owners can live on market prices.
- Fuel is available to purchase.
- Electricity is available to population.
- Water is available to population.
- Sewage treatment is available to population.

The Iraqi financial system is functioning.

- Banks are open and functioning.
  - Sufficient cash reserves.
  - Able to make loans.
- Iraqi stock market is functioning.

*(Proposed causal linkage:  
stores will be open for business if sectarian violence is sufficiently low.)*

S— Sectarian violence does not exceed the capacity of the Iraqi police and military.  
Iraqi society views the Iraqi government as “legitimate.”  
[legitimate defined how, and how much of society is necessary?]  
Iraqi society views Al Qaeda as “illegitimate.”  
[same questions]  
Iraqi society views paramilitary force as illegitimate.

I— The Iraqi utility infrastructure is able to support basic needs.

- Food supply is sufficient to meet population's needs.
  - Domestic food production
  - Food imports
- Electrical power production capacity is sufficient to meet population's needs.
  - Domestic production capacity

- Domestic distribution capacity
- Import capacity
- Fuel production capacity is sufficient to meet population's needs.
  - Domestic production capacity
  - Domestic distribution capacity
  - Import capacity
- Water supply is sufficient to meet population's needs.
  - Wells and reservoirs
  - Treatment plants
  - Water distribution system.
- Sewage treatment capacity is sufficient to meet population's needs.
  - Sewage treatment plants.
  - Sewer and drainage system.

The Iraqi transportation infrastructure is able to support basic needs

- Road and rail network
  - Roads
  - Railroads
- Bridges
  - Road bridges
  - Rail bridges

Financial infrastructure functionally sufficient

- Banking institutions have adequate facilities.
  - Physical security
  - Connectivity
- Stock trading institutions have adequate facilities.
  - Physical facilities
  - Connectivity

*(Proposed causal linkage: leads from govt. institutions are functioning.)*

I— The Iraqi people are able to obtain information about the nation-state and region.

- Radio, television, newspaper are functioning.
- Access by local and foreign press.
- Local and foreign press provides moderate or unbiased reporting.
- Local and foreign press has access and freedom of movement.

*(Proposed causal linkage from sub-bullets to “I”:*

*Functioning media provides information to population.)*

Mechanism statement for “are functioning”: 1) infers they were not functioning but have increased their capacity, so they now are functioning. Must identify a “begin” time; indefinite duration. 2) Also infers functioning media can/will do the job—if not true, may need IO, specifically PSYOPS.

## APPENDIX C: SAMPLE MODEL-BASED CAMPAIGN PLAN

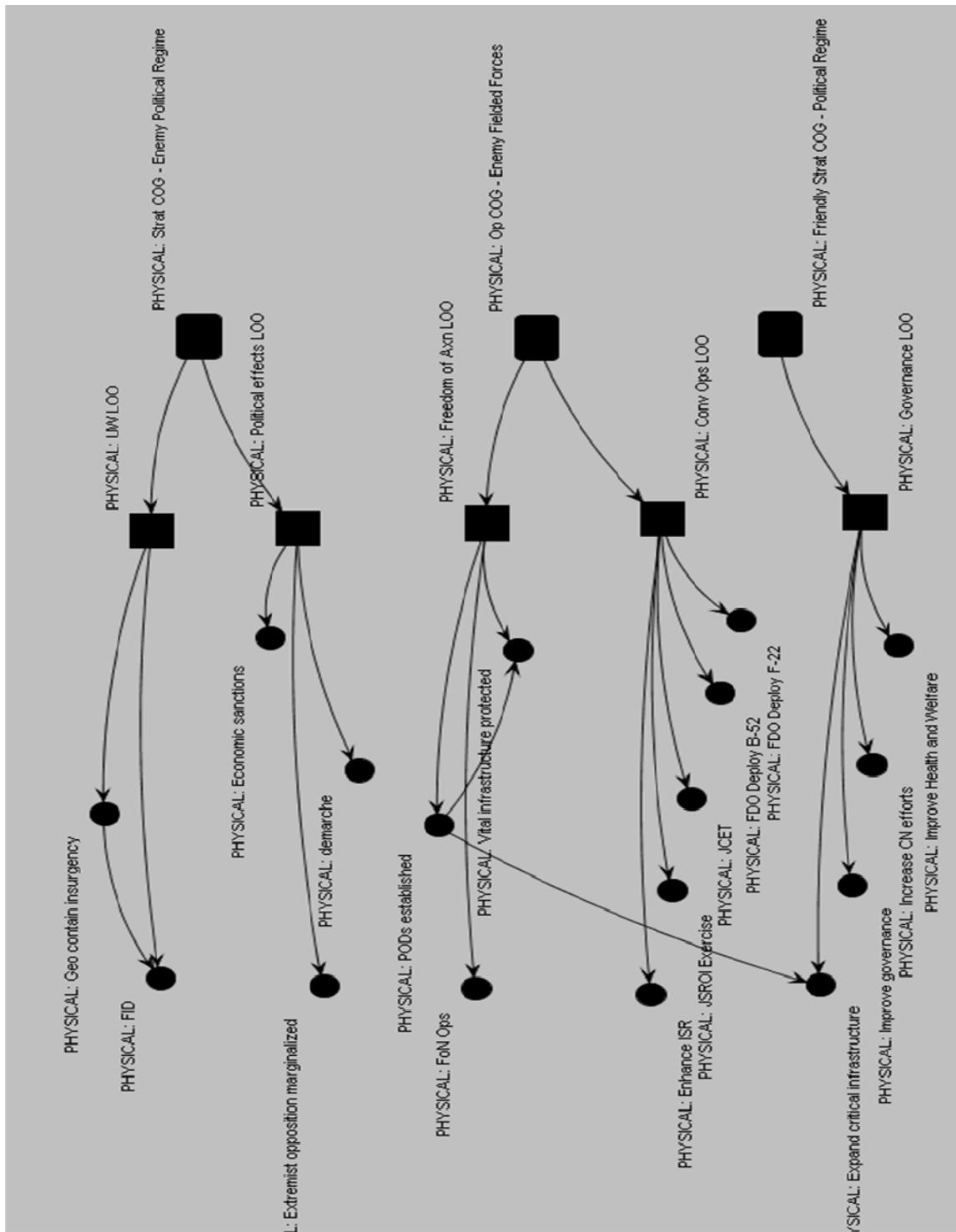
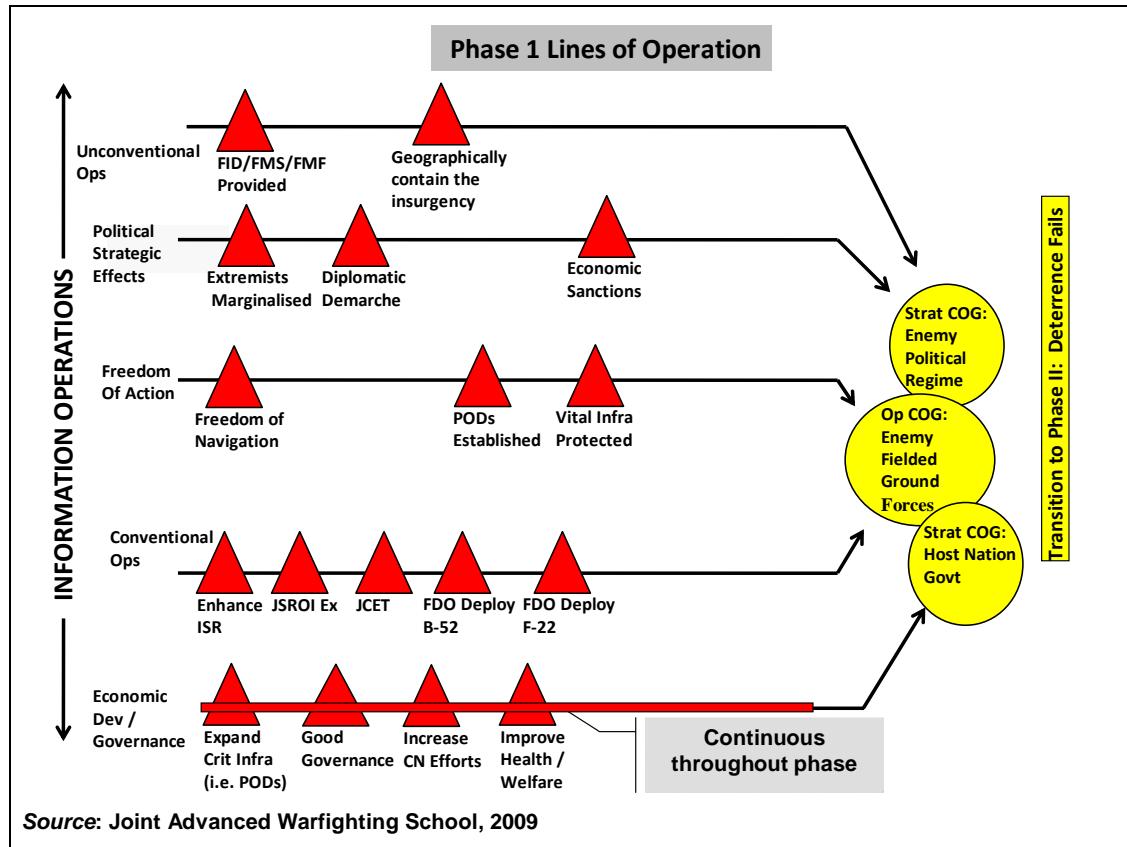


Figure 25. Appendix C: Sample Phase 1 Lines of Operation—Athena model

Figures 25 and 26 depict a set of Phase 1 (“Deter”) LLO’s developed as part of a larger CONPLAN. Compared to the Athena model, the PowerPoint version strongly implies time sequencing and direct dependence on predecessor activities. Some cross-dependencies have been added to the Athena model for illustration.



**Figure 26. Appendix C: Sample Phase 1 Lines of Operation—PowerPoint**

This model (Figure 25) demonstrates the tool can be used for different types of planning activities—the Iraq NSES model in Chapter 4 was primarily Phase 4 (“Stabilize and Reconstruct”) and Phase 5 (“Transition to Civil Authority”) activity. The figures also illustrate Athena’s current form as an analyst/planner tool, not focused on executive presentation.

## APPENDIX D: MODIFIED LEE FRAMEWORK FOR ANALYSIS

A policymaker's tool for guided discussion and thought.

*Source:* Dr. Bradford Lee, US Naval War College, modified by the author.

### Courses of action

- How to employ (offense/defense/levels of risk)?
- Which instruments?
- Operational concept for instruments?
- Military objective/target selection?

### <Enemy military action/reaction

- Commander's Estimate of the Situation*
- When considering enemy capabilities, avoid mirror imaging and other pitfalls (e.g. scriptwriting)*

- How will enemy fight?
- (symmetric/asymmetric)
- How well will enemy fight?
- Given these, how will interaction play out?

### Strategic effects of COA

- Military state of affairs/military objective achieved, hopefully obtains desired strategic effects*
- including how achieved, possibly affects strategic effects obtained (e.g. speed)*

- Direct military effects—usually can't directly translate to strategic effects
- 2<sup>nd</sup> order effects
- Logistic effects
- Economic effects—war sector or whole economic system
- Psychological effects (military, people, government)
- C3 effects
- Arcane effects
- Political effects (impact on who has influence in enemy regime, including political decapitation)
- Strategic choice effects (induced strategic blunder)
- Resource allocation effects (including misallocation)
- “Treasure” effects
- Coalition effects (including informal coalitions)

↓

### <Enemy political reaction

- Who are major players (in enemy political system)?
- State of mind?/Balance of power?
- Impact of strategic effects on state of mind/balance of power?
- Shock? Paralysis? Resolve?
- Accept “Denial”? Lockout (“Denial Plus”)? Reassessment?
- Robert Pape’s Denial forgets reassessment
- Lockout accounts for reassessment
- Hard to know, so consider...

### Political endgame in enemy regime

*-Must consider type of regime and value of object*

- Bitter end (more common intra-state or sub-state than inter-state)
- Rational calculation (doesn’t happen as usually thought—leaders interest vs. nation’s interest)
- Internal political shift (election, legislative vote, coup, revolution, non-violent factional struggle)
- Imploding Clausewitzian triangle (or fear of it--rational calculation of a different type)
- Managed problem (acknowledged partial solution or enemy political system has little/no influence)

### Durability of End-state

*-How to ensure/promote—e.g. occupation permits use of all DIMEFIL instruments*

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